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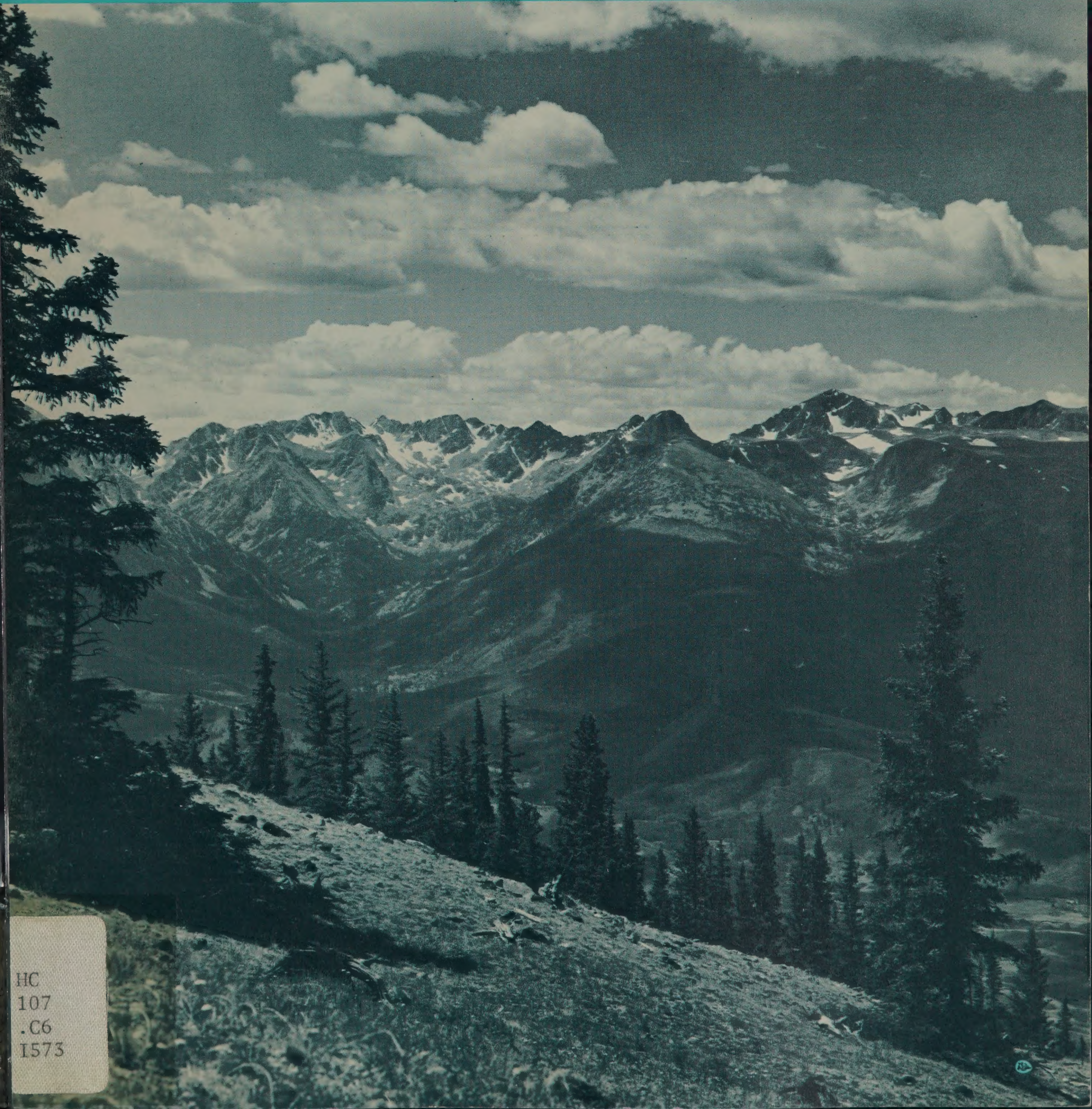
Natural Resources of
COLORADO

Prepared by the - United States Department of the Interior - Stewart L. Udall , Secretary



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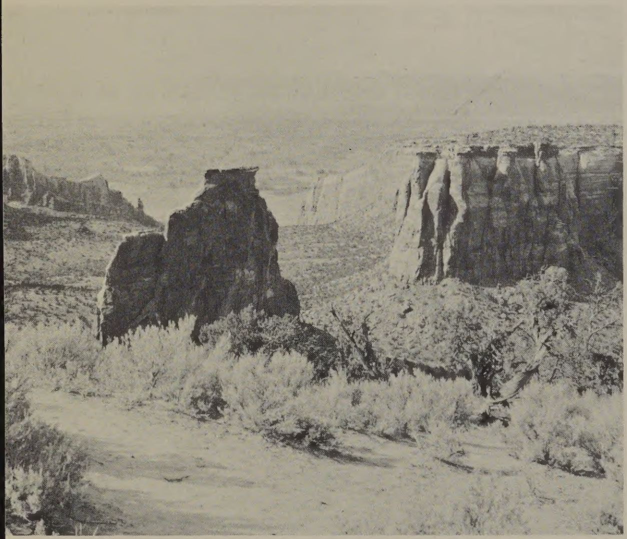

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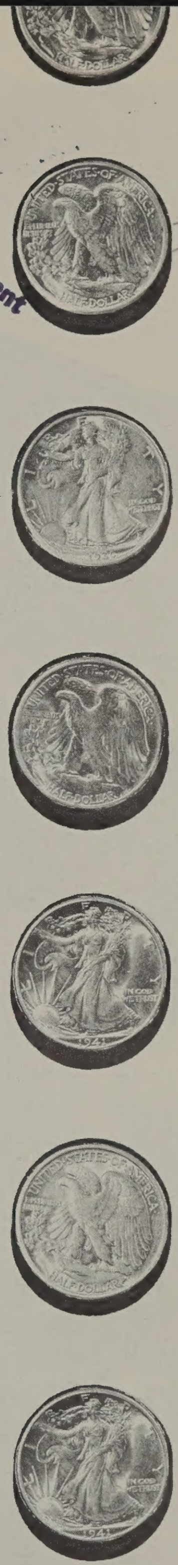
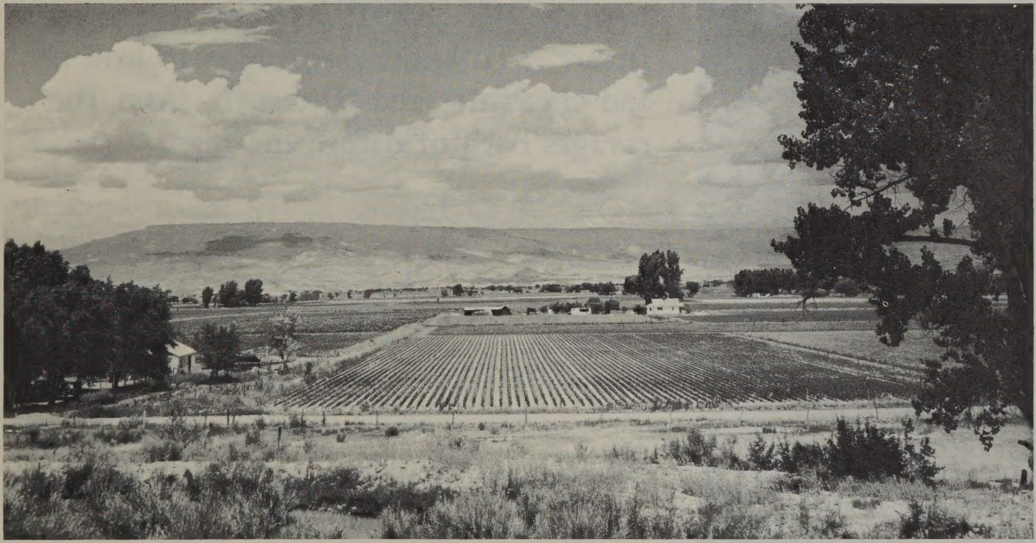


The Natural Resources of COLORADO



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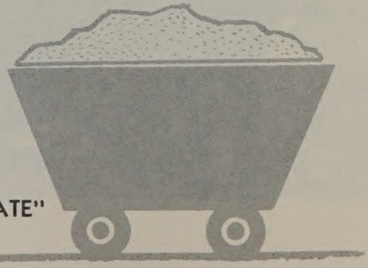
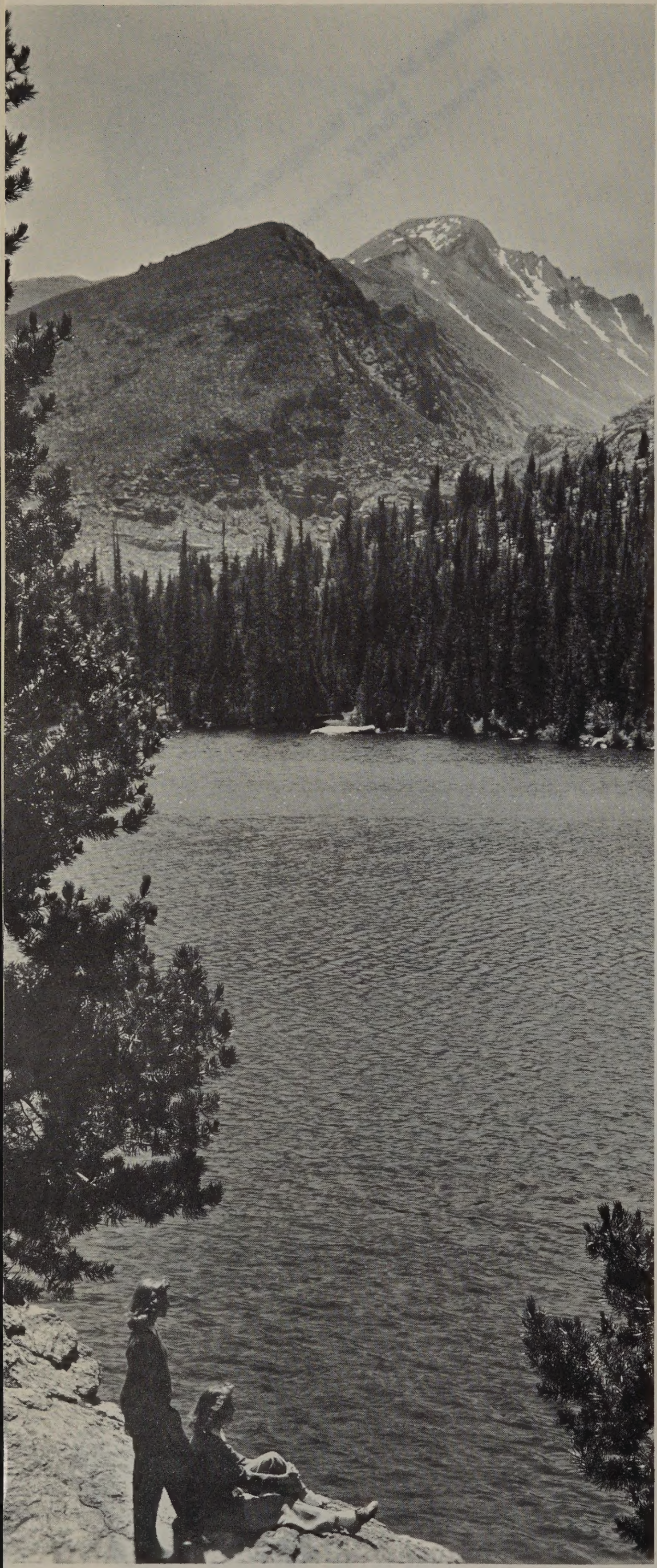
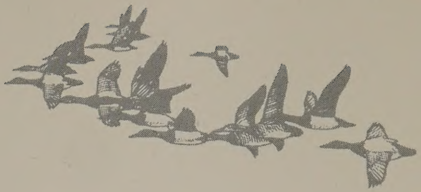


COLORADO "THE SILVER STATE"

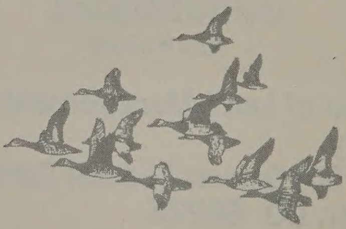




The purpose of this booklet is to bring a new awareness on the part of the American people of our rich natural resource heritage, its history, its present, and its future. To know our land is to love it and cherish it and protect it from the ravages both of nature and man.

Stewart L Udall

Secretary of the Interior.



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Credits

The Department of the Interior is indebted to the following for illustrations appearing on pages as indicated:

Colorado Department of Public Relations: 10, 41–43, 50 (except top right), 67, 71; Colorado Springs Chamber of Commerce: 11, 49; Boulder Chamber of Commerce: 50 (top right); Colorado Fuel and Iron Corporation: 38, 39; Colorado Fish and Game Department: 23.

Acknowledgments

The Department of the Interior gratefully acknowledges the assistance of the Forest Service, United States Department of Agriculture, and the United States Army Corps of Engineers, Department of Defense, for providing certain textual material and photographs appearing in this publication.

Introduction and History

Lured by a dream, by the cry of gold!, and by wonders above and below the land, men came to Colorado and discovered in the mountains and plains much more than they had sought.

Less than 50 years after Columbus discovered America, early Spanish explorers are reputed to have crossed the southeastern corner of the State in search of the fabled "Seven Cities of Cibola." They traveled the land upon which more than 25,000 years before, ancient man had

tracked down the ponderous mammoth—for the area was one of the first on the continent to be inhabited. They passed places where cliff dwellers had built their strange settlements, and then vanished behind the veil of time to be replaced by the prehistoric Indians.

Advent of Settlers

On another search in 1806, Capt. Zebulon M. Pike discovered the peak that now bears his name and which inspired the slogan "Pikes Peak or Bust" on the covered wagons of those who crossed the plains in 1849 in search of gold. Famous routes such as the Old Spanish Trail and the Santa Fe and Overland Trails were established and, later, among those who traveled over them were such historic figures as Kit Carson, Buffalo Bill Cody, John C. Fremont, "Doc" Holliday and others.

Colorado has been part of six nations and eight territories. Colorado Territory was created in 1861 from Kansas Territory when Kansas became a State. Statehood was granted to Colorado on August 1, 1876, centennial year of the signing of the Declaration of Independence, thus inspiring the name "The Centennial State." Because of its magnificent summits, Colorado has also been called the "Mountain State" or "Alpine State."

The Pikes Peak rush brought men of almost every nationality, occupation, and station in life to Colorado. When these pioneers came, buffalo roamed the plain in great numbers, stalked by Indians of the Cheyenne, Arapaho, Commanche, and Kiowa Tribes. Trappers and miners heading into the mountains came upon the Ute Indians of Shoshonean stock. One by one, all the tribes but the Utes were subdued and moved to reservations in other regions. By 1880, peace came between the white man and the Ute after a long series of uprisings.

Today the State has an Indian population of slightly over 4,000. Two groups of Utes—Southern and Ute Mountain—occupy adjoining reservations in the southwestern corner of Colorado, with lands extending into New Mexico. But the Indian has left his mark on the land—in relic and ruin, in legend and folklore, in place names that preserve the memory of their tribes, their greatest chiefs and warriors, and their indelible contribution to our historic past.

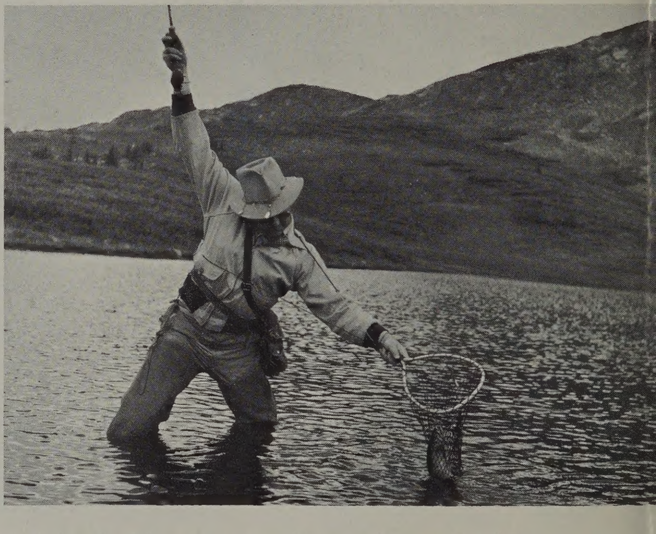
Population Growth

Colorado's citizenry has more than tripled since 1900, the greatest gain taking place in the last 10 years. In the 1960 census Colorado's population was 1,753,947, 33d in rank among States, an increase of 32.4 percent since 1950. Population averages 16.9 persons per square mile and only eight States, all in the West, have less density of population.

Out of basic resources and an excellent geographic position, Colorado, with her energetic populace, has emerged as the commercial, financial, manufacturing, professional, and cultural center of the Intermountain West. Surveys of Colorado's industry and commerce show productivity is high, employment is stable, and labor relations are good. Steel is the State's foremost manufactured article but mineral extraction and agriculture remain its two basic industries.

Resource Wealth

Resources abound in Colorado. They include lands, different and delightful, contributing much to the pleasure of Coloradans and their visitors; minerals and metals, supplies and production of several ranking first in the Nation; water, flowing in six major rivers, originating in Colorado's high Rockies and spreading out through 18 neighboring States; agriculture and livestock, making Denver—its largest city—one of the Nation's leading livestock processing and shipping points; game and fish resources, enjoyed, preserved and replenished by sports enthusiasts.



A Colorado fisherman nets a big one from an icy lake in the San Juan Primitive Area.

The highest State in the Union, Colorado offers a wide variety of scenic delights with glaciers, summer snow banks, immense forests of pine and spruce, half-mile-deep canyons, and twelve-thousand-foot passes.

Dominated by the lofty Rocky Mountains which form the Continental Divide between the dry plains to the east and the plateaus to the west, Colorado country is ideal for recreation activities. In a region of mountain forests, lakes and streams, in addition to canyons and other geologic formations and a variety of additional spectacular attractions which include over 50 mountain peaks soaring to heights of 14,000 feet or more, Colorado is one of the foremost vacation playgrounds in the Nation.

Colorado is equally famous for its hunting and fishing. Among the State's many kinds of game, elk and deer are especially popular. Expenditures by hunters and fishermen in Colorado amounted to an estimated $90 million in a recent survey. In the last 25 years, tourists have brought more than $3 billion in revenue to the State.

Superb scenery, world famous skiing, rodeos, fairs, and many uniquely Western sports and events bring millions of tourists to the State every year, and the ideal climate and central location of Colorado make it a popular spot for conventions and meetings.

National Park Service ranger points out cloud-banked Shadow Mountain from Lake Branby in Shadow Mountain National Recreation Area.

Minerals in Abundance

Bounteous mineral resources were the attraction that caused the settling of Colorado a little more than a hundred years ago, and mineral production has been a major factor of the State's economy ever since. When prospectors first surveyed Colorado's ranging skyline, they had only the vaguest notion of the great mineral wealth stored in the mountains. Early prospectors thought only in terms of gold, little realizing that the mountains and plains contain approximately 250 useful mineral products, of which over 35 are now being extracted commercially.

Knowledge of mineral resources has grown with production so that today the known resources are greater than ever before, despite continued extraction. Mines producing gold, silver, lead, and copper first brought fame to the Centennial State but in recent years, fuels have accounted for more than half the total mineral output. Even among metals, the old patterns have shifted. Uranium, molybedum, zinc and vanadium are now more important to the State's economy than lead, copper, or gold and silver.

Land—The basis of progress

Before the gold-hunters penetrated the Pikes Peak country, farming communities had already been established by Spanish speaking people in the southern part of the State. By the end of the 19th century, Colorado discovered that its greatest source of wealth lay not in its mines but its farms.

Agricultural production in Colorado continues to grow. The livestock industry is a major one in Colorado and the State ranks fourth in the Nation in production of sheep and lambs. The State is one of the leaders in the Nation in the use of agricultural irrigation water.

Major Colorado crops include wheat, potatoes, sugar beets, dry beans, corn, oats, barley, sorghum, broomcorn, lettuce, tomatoes, cabbage, Pascal celery, and several other vegetables. Colorado is also famous for its flowers and is known the world over as a producer of champion carnations.

Colorado Today

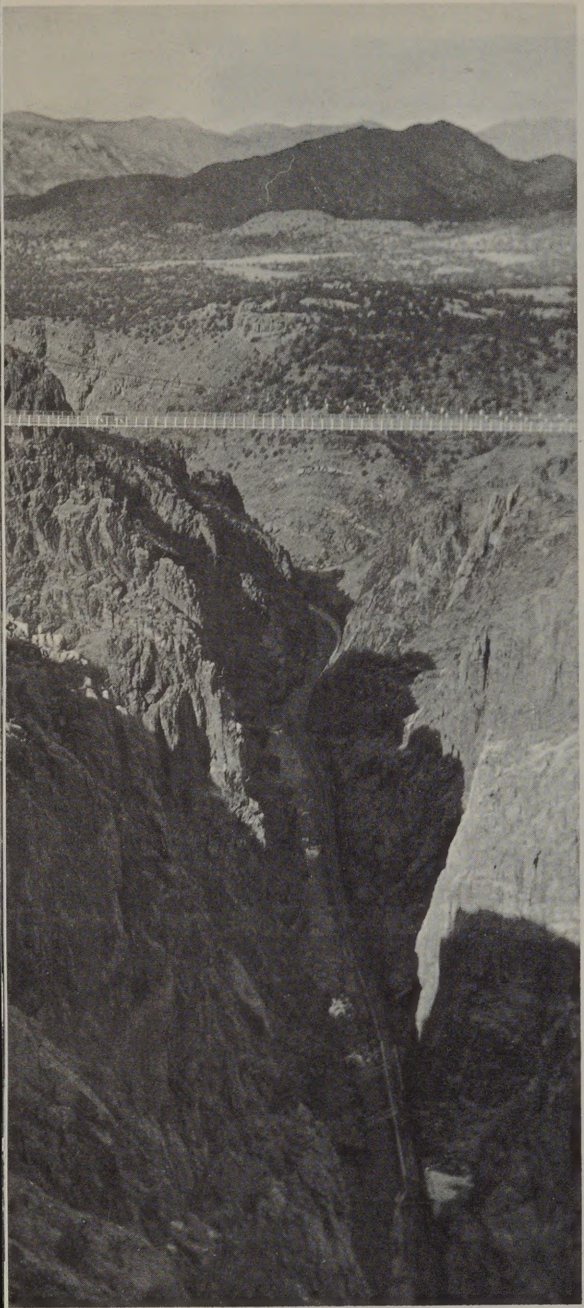
The State Capitol is in Denver, largest city in the State and 23d largest in the Nation with a 1960 population of 493,887. Denver, located at the foot of the Rockies, called the "Queen City of the Plains" and "Mile High City" because of its elevation, is a vacation and recreation capital, as well as the commercial and cultural hub of the Rocky Mountain West.

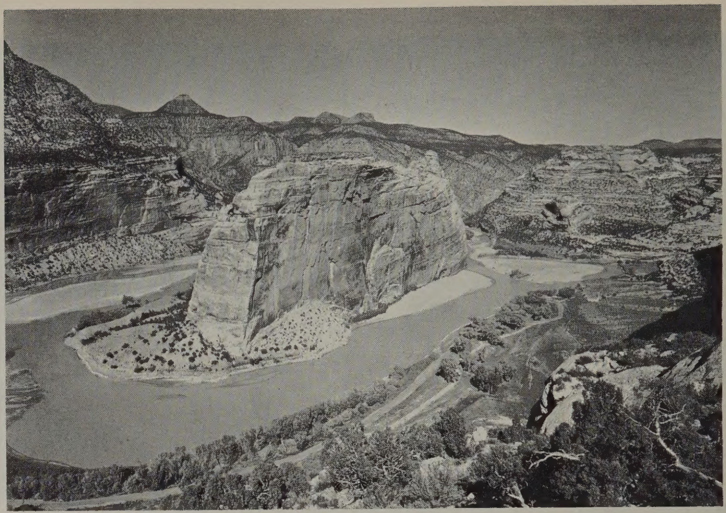
Other major cities in Colorado include Boulder (37,718 pop.), Colorado Springs (70,194 pop.), Aurora (48,348 pop.), and Pueblo (91,181 pop.).

Principal universities in Colorado are the University of Colorado at Boulder, Colorado State University at Fort Collins, and the University of Denver. The United States Air Force Academy is located near Colorado Springs.

Through the years, the Department of the Interior has played an active role in natural resource programs and Indian affairs in Colorado and it is proud of the contribution it has made to the State's growth and progress.

Visitors to Rocky Mountain National Park in the Front Range of the Rockies view outstanding examples of glaciation in the 10,000 to 14,500-foot peaks. Winter recreation activities here are among the finest in the country.





(Above) Steamboat Rock is only one of the many impressive features of Dinosaur National Monument where remains of prehistoric animals are etched in exposed rock.

(Left) The Royal Gorge Bridge spans the upper Arkansas River in central Colorado.

(Right) The Gateway to the Garden of the Gods near Colorado Springs, with snowcapped Pikes Peak in the background.

(Below) A Colorado cowboy sizes up the rough country in the northwest corner of Colorado near Craig, in the foothills of the Rockies.

Physical Characteristics of Colorado

Located near the center of the western half of the United States, Colorado is bounded by six States: Wyoming on the north, Nebraska on the northeast, Kansas on the east, the Oklahoma Panhandle on the southeast, New Mexico on the south and Utah on the west.

The eighth largest State in the Union, Colorado is a rectangular area of about 104,000 square miles lying across the Rocky Mountains, the

backbone of the continent. Included in it are lands acquired in the Louisiana Purchase of 1803, lands ceded by Mexico in 1848, and lands acquired from Texas in 1850.

Because of its vast mountain area and its position in the interior of the continent, Colorado is the highest of all the States. It has an approximate mean altitude of 6,800 feet, and even the lowest point in the State—where the Arkansas River crosses the Kansas border—is at an altitude of 3,400 feet. More than 50 mountain peaks exceed 14,000 feet in altitude, and many hundreds exceed 10,000 feet. Pikes Peak (14,110 altitude) is perhaps the most spectacular, rising abruptly as it does from the plains and not from the shoulders of other mountains. Mt. Elbert (14,431) near Leadville is the highest point in the State. The highest auto road in America climbs to the top of Mt. Evans (14,264 feet), 56 miles west of Denver.

The Continental Divide, which forms the crest of the continent and separates the watersheds of the Pacific Ocean and the Gulf of Mexico, runs through the west-central part of Colorado in a general north-south direction. It splits the State into two roughly equal sections—the Eastern and Western Slope—geographically and economically distinct.

Six major rivers in the western United States have their sources in Colorado's high mountains: The Colorado, the Rio Grande, the Arkansas, the North and South Platte Rivers and the Republican River. The waters of these rivers spread out through 18 neighboring States.

The total area of Colorado extends over 104,240 square miles of which 103,884 square miles are land surface with the remaining few hundred square miles devoted to water surface.

Three Major Areas

The State lies within three major physical provinces, the Great Plains, the Rocky Mountains, and the Colorado Plateau. The Great Plains occupy the eastern two-fifths of the State, and except as disrupted by stream valleys, are a vast tableland that slopes gently eastward from the foot of the mountains in Colorado far into Kansas and Nebraska.

Along the base of the foothills within a 30-mile-wide strip extending from Wyoming to New Mexico live two-thirds of all Coloradans.

The mountain province extends north-south through the middle of Colorado and constitutes another two-fifths of the State. Many individual mountain ranges or groups lie within this province.

The western one-fifth of Colorado is part of the Colorado Plateau province, which extends far to the west in Utah and to the south and southwest in New Mexico and Arizona. High, flat uplands deeply incised by valleys and canyons characterize this province.

Climate of Colorado

The climate of Colorado is largely determined by two factors of its geography:

First, its inland location, far removed from any major source of moisture;

Second, its high elevation, with its mountain ranges extending generally north and south from the center of the State westward, but with many spurs and high plateaus in various directions enclosing numerous high mountain parks and valleys.

The primary effects of the first factor are wide daily and seasonal temperature variations and low precipitation. Average annual total precipitation at lower elevations ranges from less than 10 inches in some of the enclosed valleys to near 18 inches in the more favored plains areas.

The second factor has a profound effect on all phases of the climate. Precipitation in the mountains is much greater, reaching annual averages of over 50 inches in some of the higher ranges; and temperatures are modified in mountain areas because of higher elevation and in lower areas because of the far-reaching influence of the mountain barriers.

Colorado is known for its cool summer weather, its high percentage of clear sunshiny days, and its invigorating high, clear, relatively dry atmosphere. Because of the varied topography, wide variations in climate often occur within relatively short distances. For example, the average annual snowfall at Cumbres Pass is over 300 inches, while at Manassa, less than 30 miles away, it is only about 25 inches. Equal variations in temperature—summer and winter—are also found.

Benefits of the alpine climate of the high mountains are innumerable. Among them is the heavy snowfall occurring during the winter and spring months. Most of the higher western slope areas receive in excess of 10 feet of snow during an average year with some amounts exceeding 30 feet. This snow melting in the spring and summer provides irrigation water which makes possible bountiful agricultural production on land that would otherwise be semiarid prairie. The heavy snows provide excellent winter skiing, many of the higher slopes remaining blanketed well into the summer season.

The summer season in the mountains is cool and refreshing, which makes them an ideal vacation area. At typical mountain stations the July average temperature is in the neighbor-

Painted Wall section of the Black Canyon of the Gunnison, from the North Rim.

hood of 60°, and extreme high temperatures fall in the range of 90° to 95°. Above 7,000 feet nights are quite cool throughout the summer, and the usual bright sunshine makes the days comfortably warm. Even in midwinter when air temperatures are low, the warm sunshine and clear air of higher altitudes make such temperatures much more comfortable than would be experienced under other circumstances.

Denver, at the high western edge of the Plains, has a mean annual temperature of about 50°, and an average annual rainfall of about 16 inches. Where water is available for irrigation, as along the South Platte and Arkansas valleys, fine and diversified crops are raised. Elsewhere on the Plains, hardy grains are grown on dryland farms, in an annual gamble with the weather, and much stock is raised.

Colorado's great diversity of flowers, shrubs, and trees is attributable to the climactic conditions that prevail at widely different altitudes. Prairie flowers and cacti bloom in the drier regions with marigold, sunflower and other hardy plants. Berry shrubs and columbine, Colorado's official flower, carpet the foothill region. In the mountains the air is filled with the scent of wild flowers and flowering shrubs.

Recreation Resources of Colorado

Colorado is one of the prime outdoor recreation areas of the Nation. Its wide range of temperature and varied topography provide activities to suit practically all tastes, and hundreds of thousands of Americans seeking outdoor recreation make tourism third among the State's industries.

One fourth of the State is forested providing—in addition to timber resources, watershed protection, and wildlife habitat—a wide and varied recreation base.

The summer and winter resorts such as Aspen provide considerable attraction. Winter snow conditions for skiing last sometimes as late as May. The ideal camping season is mid-June to early September, although many campgrounds are open from May to October.

Many sites of archeological interest are available for exploration; those in the southwest are combined with strikingly eroded topography. Mountain ghost towns from the days of the Forty Niners, old trading posts, and other areas still exist. Ten sites have been considered as eligible for status as Registered National Historic Landmarks: Lindenmeier Site; Pikes Peak; Pike Stockade; Raton Pass; Central City; Cripple Creek; Silverton-Telluride Area; Leadville; and the Denver-Rio Grande Railroad from Durango to Silverton.

Park Development Programs

Under its long-range park development program, the Department's National Park Service is making rapid progress in its improvement plans for Colorado areas.

For example, during a recent survey for the proposed campground on Navajo Hill in Mesa Verde National Park, park archeologists discovered extensive ditches and channels of a prehistoric system for catching and collecting water used for domestic purposes by the agricultural Indians who inhabited the mesa and surrounding regions for more than 1,300 years. The display and explanation of this newly dis-

(Right) Towering cliffs overshadow a pine-encircled lake in Rocky Mountain National Park, central Colorado.

(Below) Reservoirs formed by Bureau of Reclamation projects add water-based outdoor recreation features to Colorado's many other unique recreational attractions.

(Left) A visiting schoolteacher from Missouri adds to her scenic National Park pictures with a photograph of the Black Canyon of the Gunnison River National Monument in southern Colorado.

(Right) Visitors take advantage of the campground and picnic areas maintained by the National Park Service in Great Sand Dunes National Monument, Colorado.

covered water system to the public will play an important part in the interpretive story of Mesa Verde.

Other Park Service developments in Colorado include: a new Visitor Center at Great Sand Dunes National Monument; a campsite development at the Black Canyon of the Gunnison; a new Visitor Center and observation shelter at Colorado National Monument; picnic development at Dinosaur; new visitor facilities at Rocky Mountain National Park; ruins repair and stabilization at Hovenweep; and stabilization of Cliff Palace and Free-Standing Arch above Little Long House in Mesa Verde National Park.

National Park Areas

In total, areas administered by the National Park Service in Colorado include two National Parks; six National Monuments; and one National Recreation Area, representing a total area of 526,412 acres with visitors totaling nearly 3 million a year.

Mesa Verde National Park contains hundreds of prehistoric ruins ranging from small excavated pit houses and large surface pueblos to magnificent cliff dwellings in canyon walls. The Park can be reached by U.S. Highway 160, midway between Cortez and Mancos, Colo.

Rocky Mountain National Park is the spectacular part of the Front Range of the Rocky Mountains, with 65 named peaks from 10,000 to 14,255 feet elevation with outstanding displays of glaciation. The Hidden Valley section of the Park is a wonderful winter outdoor recreation area. The Park can be easily reached from the East and West by a number of routes.

Black Canyon of the Gunnison National Monument, spectacular gorge of the Gunnison River, is notable for its narrowness, depth, ruggedness, and great expanses of sheer walls, its depth accentuating the darkness of ancient rocks of obscure origin. Both rims of the Canyon are accessible by car from early spring to late autumn via U.S. Route 50 from Montrose or U.S. Route 92 from Crawford, Colo.

Colorado National Monument has colorful and spectacular erosional forms consisting of massive ramparts, sheer-walled canyons, and delicately sculptured spires and columns. The Monument is easily accessible on U.S. Route 6 or U.S. Route 50 through Grand Junction.

Dinosaur National Monument consists of a semiarid wilderness plateau cut by great gorges; smooth water and rapids, tilted strata that represent millions of years of geologic processes, with rich deposits of skeletal remains of prehistoric reptiles. The Monument is located 21 miles from Vernal, Utah.

Great Sand Dunes National Monument, a 36,740-acre area, contains the largest and highest dunes in the United States. It can be reached by State Route 150 which leaves State Route 17 one mile north of Mosca.

Hovenweep National Monument includes four groups of remarkable prehistoric towers, pueblos, and cliff dwellings, located about 35 miles from Pleasant View, Colo.

Shadow Mountain National Recreation Area includes Shadow Mountain Lake and Lake Granby, two units of the Colorado-Big Thompson Project, lying adjacent to the west entrance of Rocky Mountain National Park. The area contains 48 miles of shoreline.

Bent's Old Fort National Historic Site Project contains Bent's Old Fort, which was constructed about 1833. The Fort served as a frontier supply house, a fortress for protection from the Indians, a hostelry, a trading post, a trappers' rendezvous, a storehouse and hospital during the war with Mexico, a stage station, and a stopping place for practically all caravans which passed over the mountain route of the Sante Fe Trail. Land acquisition has not been completed.

Water Recreation

In Eastern Colorado, there are 13 Bureau of Reclamation reservoir areas, most of which offer a wide variety of excellent recreational opportunities—boat and shore fishing, water skiing, power and sailboating, picnicking and camping. The State has a total of some 125,750 surface acres of lakes and reservoirs of which

(Right) Roughing it in the Rockies—some areas are not yet developed to preserve their scenic resources or provide picnic and camp sites, but still attract many visitors.

27,500 acres are in National Forests, 42,250 acres administered by the Game and Fish Department, and the remaining 56,000 acres in various types of public and private ownership. There are 10,000 miles of trout stream and 565 miles of warmer fishing water in Colorado.

State Parks

Other recreation areas include those managed by the Colorado State Park and Recreation Department; State Land Board; Department of Game and Fish and the State Historical Society.

The Colorado State Park and Recreation Department, operating since 1957, is in the process of acquiring land and presently administers eight areas with a total acreage of 25,257. These areas are Adobe Reservoir, Antero Reservoir State Recreation Area, Barker Reservoir, Beaver Park Reservoir, Cherry Creek Reservoir State Recreation Area, Eleven Mile Reservoir State Recreation Area, Sweitzer Lake State Recreation Area, and Vega Reservoir State Recreation Area.

The State Land Board has under its jurisdiction the Colorado State Forest of 72,000 acres.

The Colorado Department of Game and Fish includes a number of areas totaling nearly 150,000 acres. Among these are game management areas, game ranges, refuges, and game experimental stations.

The State Historical Society is responsible for six sites of 1,129 acres and local parks account for 38,557 acres. Historical monuments include Chief Oray, El Pueblo, Fort Garland, Fort Vasquez, Healy House, and Pike's Stockade.

National Forests

Within the boundaries of the State of Colorado are more than 15 million acres of National Forests administered by the United States Department of Agriculture. They offer a wide variety of outdoor recreational opportunities for all tastes. Justly famous for spectacular scenery, the State's National Forests encompass several of the highest peaks of the Rocky Mountains, and skiing, hiking, and camping are among favorite recreational activities. The National Forests of Colorado provide fishing and superb hunting for both large and small game, under State Department of Game and Fish regulations.

Colorado's National Forests, with their major recreational facilities and gross areas include:

Arapaho, with headquarters in Golden, covers 1,061,229 acres. Within it lie 32,400 acres of wilderness—the Gore Range-Eagle Nest Primitive Area which extends into the adjoining White River National Forest. There are 34 public campgrounds, 35 picnic areas, and five ski areas including Arapaho Basin, Berthoud Pass, and Loveland Pass.

Grand Mesa-Uncompahgre, two National Forests administered as one from Delta, covers 1,419,713 acres, 87,000 acres of which are divided between two wilderness areas, the Uncompahgre Primitive Area and the Wilson Mountains Primitive Area. There are 36 campgrounds on the Forest, eight picnic areas, and the Mesa Creek Ski Area.

Gunnison, 1,759,757 acres, has its headquarters in the town of the same name. Here are established 36 campgrounds, two picnic areas, one ski area (Rozman Hill), the West Elk Wild Area of 62,000 acres, and more than half (26,300 acres) of the La Garita Wild Area.

Manti-LaSal, with headquarters and most of its acreage in the State of Utah, has 26,000 acres in Colorado, within which is one camp and picnic area—at Buckeye Reservoir.

Pike covers 1,258,825 acres and includes 37 campgrounds and 44 picnic sites. There is one ski area—Pikes Peak. Headquarters is at Colorado Springs.

Rio Grande, with headquarters at Monte Vista, covers 1,910,787 acres including 79,300 acres of wilderness—The Upper Rio Grande Primitive Area and a part of the LaGarita Wild Area. The Forest has 29 established campgrounds and six picnic areas.

Roosevelt has its headquarters at Fort Collins and covers 1,085,155 acres, 26,797 acres of which

Hikers in Rocky Mountain National Park look for out-of-the-way views and camping places on one of the more rugged mountain trails.

are within the Rawah Wild Area. It contains 23 campgrounds and 22 picnic sites.

Routt, covering 1,264,850 acres, has its headquarters at Steamboat Springs and includes within its boundaries the 53,400-acre Mount Zirkel-Dome Peak Wild Area. There are 35 campgrounds and five picnic sites as well as two ski areas—the BPR Ski Run and Valley View Ski Run.

San Isabel, of 1,237,920 acres, has headquarters at Pueblo. This forest has 18 campgrounds, 11 picnic sites, and four ski areas—Climas, Cooper Hill, Lake Isabel, and Monarch.

San Juan, with headquarters at Durango, covers 2,086,484 acres including the 240,000-acre San Juan Primitive Area. There are 37 campgrounds, five picnic sites, and two ski areas—Mill Creek Lodge and the Stoner Ski Area.

White River, largest of Colorado's 10 National Forests, covers 2,076,443 acres, 212,855 of which are wilderness. All of the Flat Tops Primitive Area and the Maroon Bells-Snowmass Wild Area is within this forest, and 28,875 acres of the Gore Range-Eagle Nest Primitive Area. There are 54 campgrounds, two picnic areas, and three ski areas—Ashcroft, Aspen and Buttermilk. Headquarters for the Forest is at Glenwood Springs.

In addition, two National Grasslands are administered by the Department of Agriculture in Colorado. These areas, assigned to the Forest Service for administration in June 1960, cover more than 600,000 acres in Colorado. Small game and bird hunting is popular through much of this acreage.

Scenic Highway Routes

While transportation to recreation sites is primarily by auto, rail transportation is still significant on east-west lines, which traverse notably scenic territory. A fine road network provides wonderfully scenic routes which tunnel through mountains, over suspension bridges, across gorges and canyons, and zigzags up the sides of the mountains.

Privately Owned Recreation Facilities

Privately owned recreation facilities are of major importance in Colorado. These vary from resident summer camps for boys and girls to fine hunting areas. The State's crop and pasture lands contribute significantly to the supply of outdoor recreation opportunities. Many operate as vacation farms, accepting tourists who live at the farm or ranch during their stay. Others lease or supply hunting opportunities, often in combination with cabin facilities. Camping, picnicking, fishing, hiking, horseback riding and guide services are provided by some. Many lease or sell scenic sites for home and camp lots.

Private development in Colorado to accommodate many of its winter visitors include a 9,500-foot lift with 63 gondolas (Swiss) at the new resort of Vail, at the west foot of Vail Pass, and a 7,500-foot lift with 48 gondolas (Italian) being constructed at Crested Butte, near Gunnison.

Most Colorado ski resorts are at altitudes of about 7,500 feet, with the ski terrain rising to 11,000 or 12,000 feet. Ski Broadmoor, Steamboat Springs, and Winter Park are the lowest. Berthoud Pass, above the timberline, is the highest, and Aspen, Vail and Crested Butte are in between.

U.S. Route 40 goes to Winter Park and Steamboat. U.S. Route 285 leads to Monarch Pass (with the help of U.S. Route 50) and Crested Butte. From Denver, motorists can reach Vail on U.S. Route 6 in 2½ hours without breaking the speed limit. The ride will be faster when the road becomes Interstate Route 70 through Straight Creek Tunnel, 10 years hence. It crosses two of the world's most beautiful passes, Loveland, at 11,992 feet, and Vail, at 10,554 feet above sea level.

Aspen is 100 miles beyond Vail, on U.S. Route 6 to Glenwood Springs, and then doubling back on State Route 82 up the Roaring Fork.

Lists of all the privately operated recreation opportunities in Colorado are not available from any single source. Travel bureaus and agencies, commercial organizations such as gasoline companies, motel and hotel associations, airlines and railroads, local Chambers of Commerce and outdoor clubs and organizations all can supply information on many of the privately owned facilities. Local inquiry will reveal others. Information is available from the Colorado Division of Publicity, Capitol Building, Denver, Colo.

Enjoying the view before the downhill run in Aspen Winter Sports Area.

Water is America's greatest outdoor recreation attraction and new opportunities for water recreation are being provided by the development of Federal reservoirs. This is a scene of the Grand Lake Yacht Club, a feature of the Colorado-Big Thompson Project.

Fish and Wildlife Resources

Colorado was a hunting and fishing paradise all through the long reign of the mountain and plains Indians and for the unknown people who preceded the Indian. It was not, however, until after settlers came into the high country that many species of game, along with the buffalo, were threatened with near extinction.

Following on the heels of the trappers came the ruthless invasion of market hunters and of those who took their pleasure in unrestricted slaughter of wild animals—not for food or fur but only for the pleasure they derived from killing.

Not until the early 1900s were any strong efforts made to protect the State's remaining game and fish. The 1887 Session Laws created a 10-year closed season on buffalo and Rocky Mountain bighorn sheep, but not until 68 years later did bighorns appear in huntable numbers again. The last wild buffalo was killed in Lost Park not long after the turn of the century.

Modern Management

Since then, long strides have been made in the scientific management of the State's wildlife resources. Through carefully evolved conservation measures and increasingly efficient methods of propagating species of game and fish, hunting and fishing have again assumed important dimensions in Colorado. To give sportsmen greater variety in their hunting and fishing, new species of wildlife, especially game birds and fish, have been introduced.

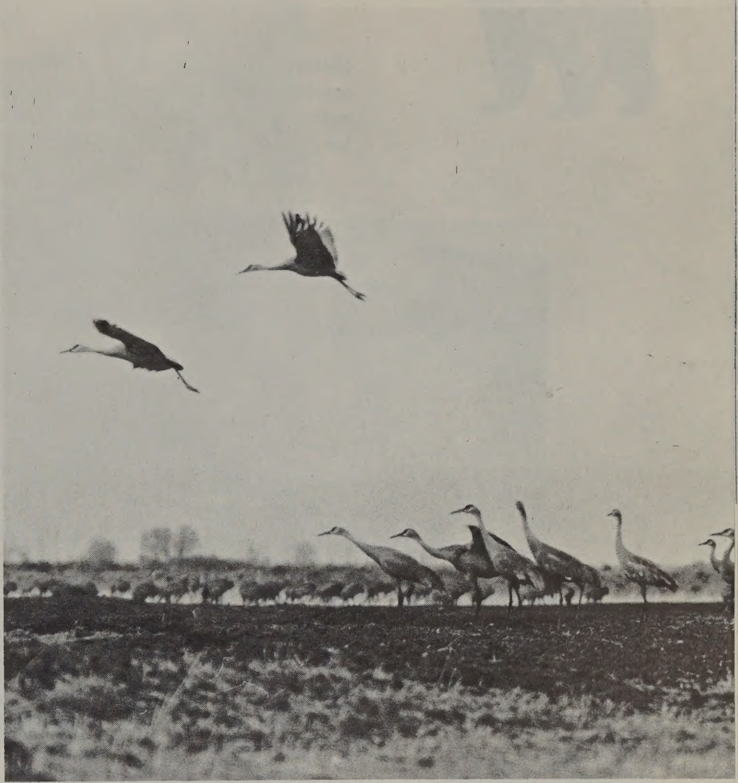
Much of this advancement is the result of research activities of the Fish and Wildlife Service of the Department of the Interior. This is the Federal Government's fish and wildlife management and research agency. The Fish and Wildlife Service's programs range from the operation of the 100-unit National Fish Hatchery System, of which two are located in Colorado to research on the effects of pesticides on fish and wildlife resources.

There are very few States today that can boast the variety of game and fish to be found in Colorado. Hunting and fishing are big business in Colorado; during 1960 some 700,000 sportsmen spent an estimated $90 million in pursuit of their chosen sport. Both numbers of participants and their expenditures have been increased since that time, placing hunting and fishing in the ranks of mining, agriculture and manufacturing as an increasingly important factor in the State's economy.

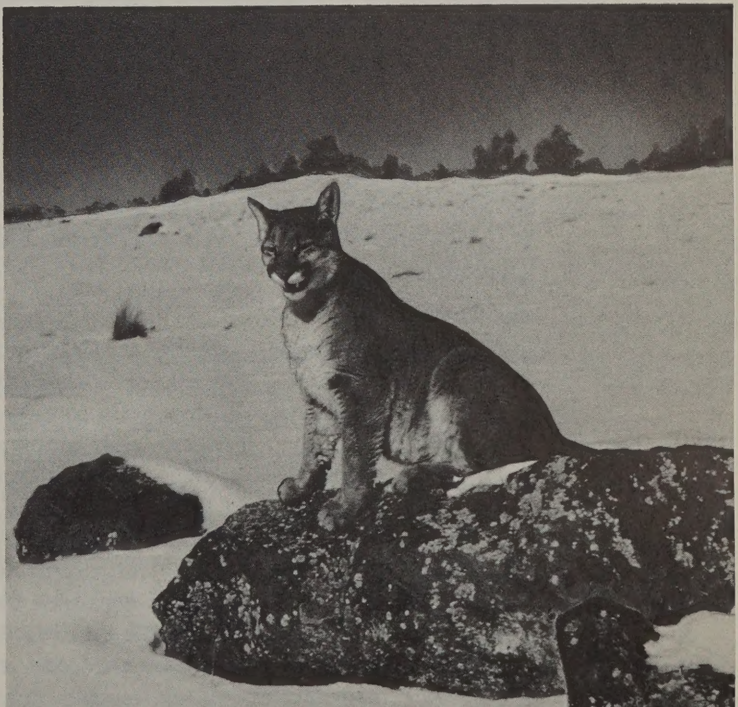
Today no game animals in Colorado face extinction by hunting. Their continued existence and well being depend on their habitat or amount of food available. In the summer months deer have an abundance of food in the higher ranges. When the deer are forced into the lower areas by heavy winter snows there would be a widespread loss of deer through starvation were it not for the harvesting of the deer by hunters.

Through carefully controlled hunting, the Colorado Game and Fish Department aims to maintain deer herds at levels where the aminals can survive in healthy conditions until spring frees the higher ranges for summer feeding again. To accomplish these goals, it engages in: surveys of game animal populations, numbers and condition, and of game range conditions; applied research; transplanting game; acquisition of land, and development of land for wildlife purposes; creating access to public land; and in improvement of regulations and education.

Many of these wildlife projects are financed through a program known as Federal Aid in Wildlife Restoration. This program is administered by the Fish and Wildlife Service. Under it, the State submits plans for a wildlife project to the Fish and Wildlife Service. If the plan



(Top) Sand Hill cranes rest and feed on the Monte Vista National Wildlife Refuge.



(Bottom) Colorado—as a result of the scientific management of its wildlife resources—is a paradise for big-game hunters. Mountain lion like this are found in numbers.

(Below) Nice catches of Kokanee salmon are taken regularly from Colorado's Reclamation reservoirs—illustrative of Reclamation's contribution to outdoor recreation for growing numbers of Americans.

(Right) Canada goose incubating eggs on an artificial nesting platform, a conservation tool which has been quite successful in Colorado.

is approved, the State may be reimbursed for up to 75 percent of the cost of the completed project. Funds for this program come from an 11 percent tax on certain types of firearms and ammunition.

Big Game

Thousands of hunters return to Colorado each year to hunt deer and elk in Colorado's rugged and largely unspoiled mountain country. Through the spring, summer, and autumn months, thousands of tourists buy fishing licenses so they can enjoy this sport in the cold, clear mountain lakes and streams in the State.

Colorado is a paradise for its big-game hunting. More than 100,000 deer are taken by hunters each year. Mule and whitetail deer, elk, black bear, and mountain lion are found in the State.

Waterfowl and Upland Game Birds

Bird hunting is virtually limited to ducks and pheasants; shooting of the latter is restricted to northeastern plains section and parts of the Western Slope. Best duck hunting is found in South Platte and San Luis Valley. Other prominent game birds found in Colorado include scaled quail, bobwhite quail, Merriam's turkey, and Blue and Sage grouse.

Fish a Plenty

Coldwater streams and lakes are stocked with four kinds of trout. Lakes and streams on plains east of the mountains are stocked with warm-water fish—bass, crappie, sun fish, cat fish, and perch.

Although Colorado has an abundance of natural lakes, they are insufficient to meet the recreational fishing demand. Storage reservoirs have partially filled the need and will become more important to the fishery in the future.

Providing enough fish for the ever-increasing

number of fishermen is a tremendous job. Primitive back-country fishing areas in Colorado are shrinking fast due to access roads, four-wheel drive and powerful scooter-type vehicles. Along with the increase in population, there are more people seeking recreation in the form of fishing. Quality fishing such as old-timers recall enjoying in the "good old days", has been on the decline.

The Colorado Game and Fish Department, however, is actively engaged in slowing down this decline and providing as many fish as possible for the fisherman's creel. To do this, it is engaged in: artificial hatching, rearing and stocking of fish; applied research; development of new fishing waters; creating free access to public fishing waters; improvement of existing water; and improvement of regulations and education.

A program very similar to the Federal Aid in Wildlife Restoration is in effect for the restoration of fish. It is also administered by the Fish and Wildlife Service. The funds for Federal Aid in Fish Restoration come from a 10 percent tax on sport fishing tackle. Colorado has been very active in the construction and development of public fishing lakes under the Federal Aid program.

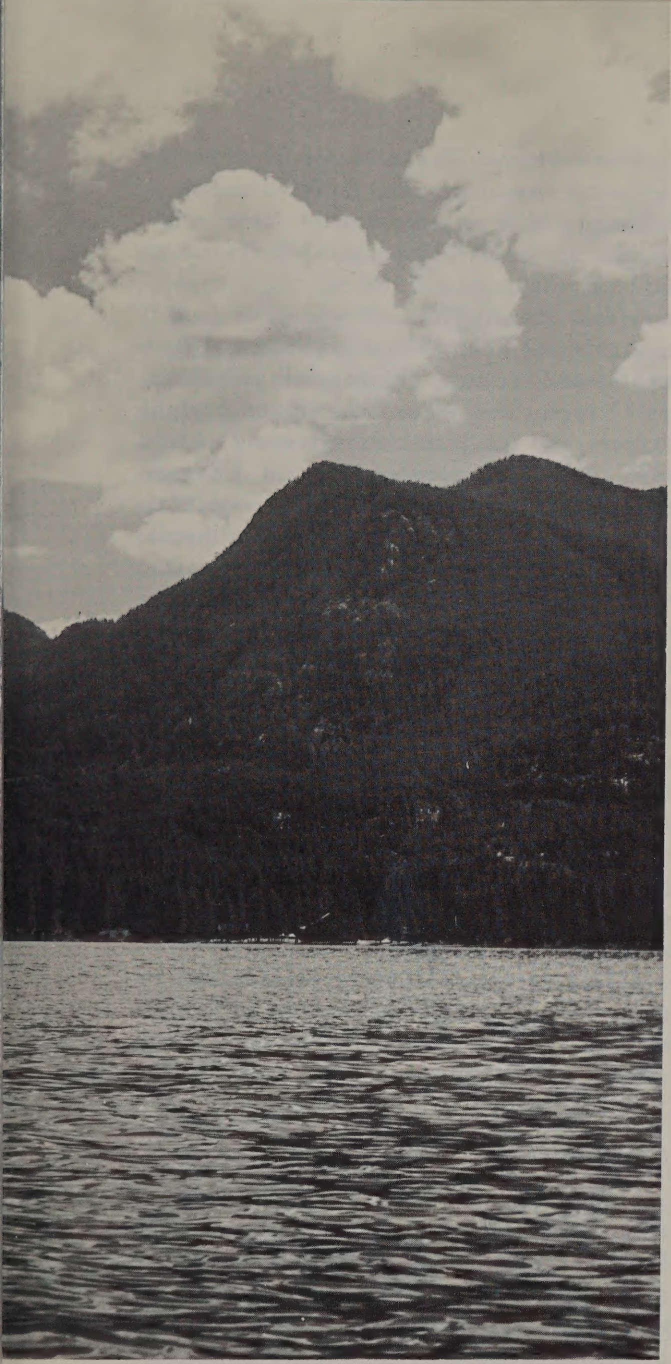
At present the Department operates 22 trout stations. Two National Fish Hatcheries also allocate a large share of fish to State waters. In recent years approximately 550 tons or 15 million trout were planted in public fishing waters annually. Approximately 5 million of these trout are of catchable size, 8 to 10 inches. In addition, more than 12 million small warm-water fish are planted.

The State Department of Game and Fish is also responsible for management of the fish and wildlife resources at 13 Bureau of Reclamation Reservoirs.

Water and Power Resources of Colorado

Water is perhaps Colorado's most valuable physical resource. The future growth of Colorado, agriculturally and industrially, will be gaged by the sum total of her available water supply. Her six important rivers—the Arkansas, Colorado, North Platte, South Platte, Republican, and Rio Grande—have been, and will continue to be, of significant importance.

Colorado is generously endowed with water,

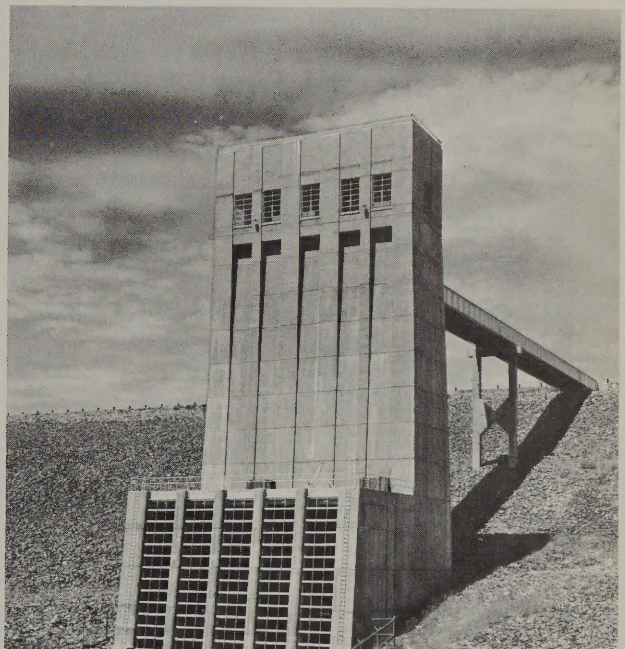


(Left) Sailboats head across Grand Lake in the Colorado-Big Thompson Project during the annual Grand Lake Yacht Club Regatta.

(Above) The walls of the Black Canyon of the Gunnison River are ancient granite and gneiss, and in places are nearly 2,000 feet high. Portions of the area are set aside as a National Monument.

but as is the case in many Western States, it is not always located where it is needed, when it is needed. With continual planning, surveys, and investigations, State and Federal Governments are cooperating on water resource development projects to assure the maximum possible benefits from Colorado's rivers and streams.

Evaluation of Colorado's land and water resources shows that Western Colorado, with



(Above) The intake structure of the 2.6 mile-long Cherry Creek Dam near Denver helps regulate flash floods. An earthfill structure, the dam rises 140 feet above the streambed and impounds 15,000 acre-feet of water.

37 percent of the total State land area, has 69 percent of the State's surface water yield; and that part of the State east of the Continental Divide, with 63 percent of the total area, has the remaining 31 percent of the State's surface water resources.

Municipalities use only a small part of the surface water available in Colorado. Municipal demand, even in the South Platte Basin where it is highest, is small compared to the average supply. The average flow of Clear Creek, a tributary of the South Platte River, is nearly equal to the water demand of all municipalities in the South Platte Basin in Colorado. It is estimated that municipal consumptive use of water is less than 2 percent of the total consumptive use of water withdrawn in the State, but because the water needs of irrigated and potentially irrigable lands in parts of the State exceed the available surface water supply, there is keen competition for the right to use the surface-water resources of the State.

Rivers in Colorado

Long rivers, flowing east to the Missouri River, southeast to the Mississippi, southward to the Gulf of Mexico and southwestward to the Gulf of California, have their sources in Colorado's high Rockies and cross the fertile lands of neighboring States. Colorado furnishes from mountain areas located on both sides of the Continental Divide of the Rockies a large measure of the water used on agricultural lands in 18 States.

The rivers of Colorado start high in the mountains, and the snowpack as it melts in the late spring and summer feeds the streams with water of excellent quality.

The right to use surface water is governed under State law under the doctrine of prior use—sometimes stated as first in use is first in right. Also, interstate compacts regulate the division of water among various States, as most of Colorado's rivers flow into other States.

Water east of the Continental Divide generally has all been appropriated for use. The Colorado River and its tributaries—west of the Divide—form the only undeveloped surface water resources in Colorado, and extensive development is planned and scheduled.

Arkansas River. The Arkansas River has its beginning near Leadville, flows southerly to Salida and then easterly through Canon City, Pueblo, La Junta, Lamar, and other southern Colorado towns.

Colorado River. The Colorado River has its source in the Rocky Mountain National Park and Grand Lake area. Its Colorado tributaries, the Yampa, the White, the Gunnison, the Dolores, and San Juan transport water drained from the entire area of Western Colorado mountains through Utah, New Mexico, Arizona, and Nevada to southern California, Mexico, and finally to the Gulf of California.

North Platte River. The North Platte River has its source in the North Park area of North Central Colorado, flows across the boundary into Wyoming, and thence into Nebraska.

South Platte River. The South Platte and its tributaries drain in the northeastern quarter of Colorado and the main stream carries water into Nebraska near Julesburg, Colo.

Republican River. The Republican River and its tributaries furnish the drainage system for the northeastern plains area of Colorado, and then discharge into Kansas.

Rio Grande Basin. The Rio Grande rises on the eastern slopes of the San Juan Mountains in south central Colorado. It flows eastward, then southward, and enters New Mexico about 35 miles southeast of the city of Alamosa, Colo.

Ground Water

Ground water is one of Colorado's important natural resources and its use is increasing because of population and industrial and agricultural growth. Ground water occurs in Colorado under a variety of geologic and hydrologic conditions; some are very complicated and a thorough understanding of these conditions is a prerequisite to proper water management.

Fifty-five percent of the 244 community water systems in Colorado are supplied exclusively by ground water, but only about 18 percent of the total population of the State is represented. In addition, most of the individual facilities in 39 communities having no community water system are supplied by ground water from individual small-capacity wells. Thirty-two community water systems are supplied from both ground and surface water sources.

The most productive sources of ground water are east of the Continental Divide in the alluvial deposits along the Rio Grande in the San Luis Valley, along the South Platte and Arkansas rivers, and in the High Plains. Sandstones in the Denver basin and in the southeastern part of the State are moderately productive. West of the Divide the alluvium along the principal streams is locally important as aquifers. The sandstones of the Colorado Plateaus and Wyoming basin are extensive but generally yield only small supplies to wells.

Although some of Colorado's aquifers are at or near optimum development, large supplies of water are still available for future use.

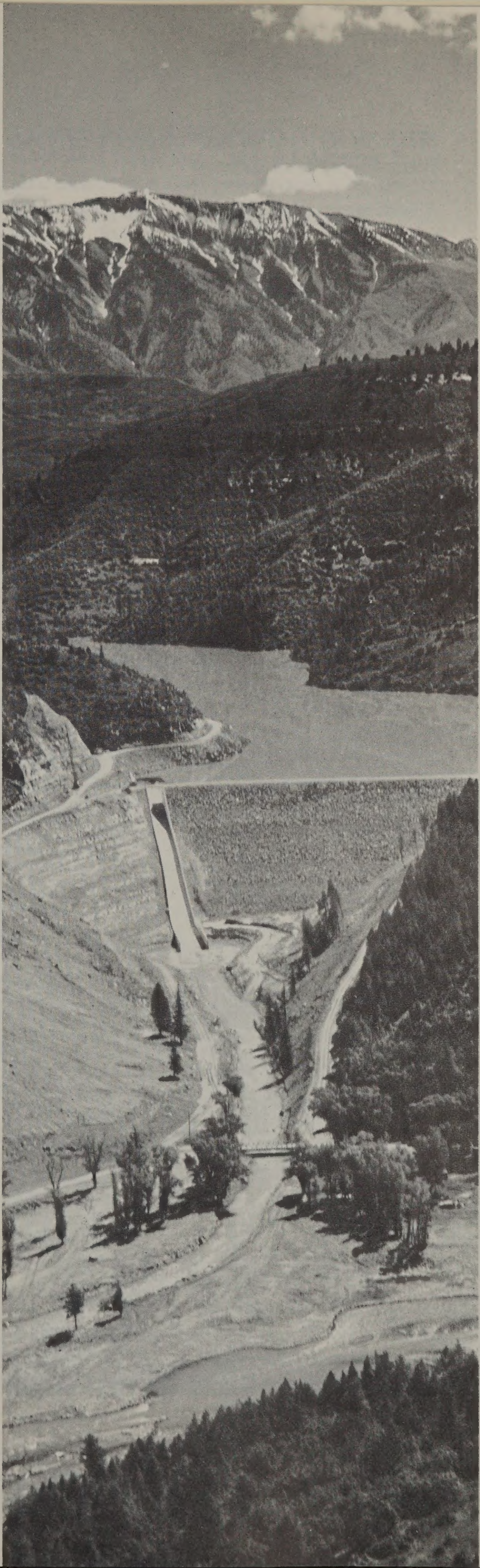
Ground-water storage is many times greater than surface-water storage, but this fact does not imply that potential development of ground-water resources is in the same proportion. The amount of ground water in storage exceeds 2 billion acre-feet; whereas, the capacity of surface-water reservoirs has been estimated at only 4.3 million acre-feet. Some of the ground-water reservoirs, if depleted, would take hundreds of years to refill under natural conditions; by comparison, the time to fill surface-water reservoirs can be measured in months and years.

Irrigation Development

Farming by irrigation in Colorado was first undertaken in the 1850's by Spanish settlers in the San Luis Valley, near the town of San Luis. In the 1860's small irrigation projects were developed by individual farmers in the Denver area, principally along Clear Creek. Most of these pioneer irrigation enterprises watered from 10 to 100 acres and the water was taken directly from the streams by means of short ditches to the low lands lying in the river valleys.

Irrigation on a large scale was first undertaken in northern Colorado in the 1870's and the 1880's with water being taken from the South Platte River and its tributaries. The undertakings were generally successful and other districts immediately followed the example of northern Colorado.

Colorado today ranks first among all the



Paonia Dam—a completed earth-filled structure on Muddy Creek—is part of the vast five-state Upper Colorado River Storage Project. This gigantic multi-purpose Reclamation endeavor will harness the waters of one of the Nation's most unruly river basins.

States in the area of land receiving its entire water supply from streams.

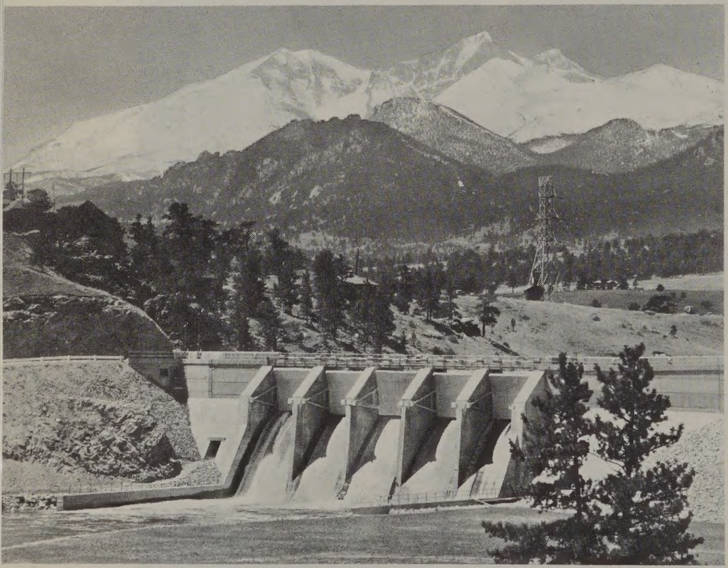
Irrigation Summary: 1960–1920

(Source: U.S. Census of Irrigation 1960)

Census year	All farms (number)	All land in farms (acres)	Irrigated farms (number)	Irrigated lands in farms (acres)
1959........	33, 390	38, 813, 392	20, 312	2, 684, 757
1954........	40, 749	38, 385, 234	23, 355	2, 262, 921
1950........	45, 578	37, 953, 099	27, 121	2, 872, 348
1945.	47, 618	36, 217, 808	28, 054	2, 698, 579
1940........	51, 436	31, 527, 240	29, 766	2, 467, 548
1935........	63, 644	29, 978, 472	(*)	(*)
1930........	59, 956	28, 876, 171	(*)	(*)
1920........	59, 934	24, 462, 014	(*)	(*)

*Not Available

The total number of water storage dams and reservoirs in Colorado is over 1,900 with a total storage capacity of approximately 4,540,000 acre-feet. The surface area of these reservoirs exceeds 205,000 acres. The highest dam in the State is the earth fill structure known as the Green Mountain Dam, located in Summit County, which has a maximum height of 309 feet. Built by the Department's Bureau of Reclamation, it not only is the highest dam in the State, but it also ranks among the highest earth dams in the Nation.



Snow-capped Longs Peak is in the background of this view of Olympus Dam Spillway on the Colorado-Big Thompson Reclamation Project.

The U.S. Army Corps of Engineers, John Martin (Caddoa) Reservoir is the largest in the State, with a capacity of 645,500 acre-feet and a maximum surface area of 18,400 acres.

Colorado has several important water tunnels constructed for the purpose of diverting water to be used in irrigating the land. Some of these are transmountain water diversion projects.

Construction has started on several units of the Colorado River Storage Project and Congress has authorized the Fryingpan-Arkansas Project which will divert some 69,000 acre-feet per year from the Colorado River Basin into the Arkansas River Basin.

Major Bureau of Reclamation Projects Constructed and Under Construction in Colorado

Name of Project	Start of construction	Date of completion
Curecanti Unit, Colorado River Storage..	1961	....
Florida..............................	1961	....
Smith Fork..........................	1960	....
Collbran............................	1957	....
San Luis Valley Conejos Division (Platoro Reservoir).........................	1949	1951
St. Francis Unit, Missouri River Basin (Bonny Reservoir)	1948	1951
Paonia..............................	1948	....
Mancos..............................	1941	1948
Colorado-Big Thompson...............	1938	1959
Fruitgrowers Dam....................	1938	1939
Pine River..........................	1938	1941
Grand Valley........................	1912	1933
Uncompahgre.........................	1904	1937

The U.S. Army Corps of Engineers builds various projects for flood control and conservation. Among these multiple-purpose projects is Cherry Creek Dam and Reservoir, about six miles southeast of Denver, representing a part of the Comprehensive program for the Missouri River Basin. The Geological Survey of the Department of the Interior compiles data relative to both surface and underground water possibilities. The Forest Service and Soil Conservation Service of the Agriculture Department are also conducting research and construction and developing small watershed projects for improvement of water conservation practices.

In addition, the Colorado Water Conservation Board works to appraise and inventory the State's water resources and develop programs for their conservation, utilization and control.

Power Resources

Colorado River tributaries flowing down the steep western slopes of the Rocky Mountains that form the Continental Divide present many favorable opportunities for hydroelectric power development. Although large fuel deposits are available in western Colorado, it has been more economical to install hydroelectric rather than fuel burning plants.

Hydroelectric powerplants constructed in western Colorado as a part of Federal Reclamation projects include the Green Mountain project with a capacity of 21,600 kilowatts, the Grand Valley Powerplant of the Grand Valley project with a capacity of 3,000 kilowatts, and the Upper and Lower Molina Powerplants of the Collbran project with combined capacities of 13,500 kilowatts.

By far the largest Federal developments to be constructed will be the three powerplants of the authorized Curecanti Unit of the Colorado River Storage project, on the Gunnison River—a powerplant of 60,000 kilowatts, on the uppermost Blue Mesa Dam, and the Morrow Point Dam and Crystal Dam powerplants with 120,000 kilowatts and 20,000 kilowatts respectively, and the Rocky Mountain Power Co. power development.

Vallecitto Dam, part of the Pine River Project, is one of many dams in Colorado which store water for a thriving agricultural economy.

Hydroelectric powerplants constructed in eastern Colorado as a part of Federal Reclamation projects include Estes, Marys Lake, Flatiron, Pole Hill and Big Thompson powerplants of the Colorado-Big Thompson project with a total capacity of 162,350 kilowatts.

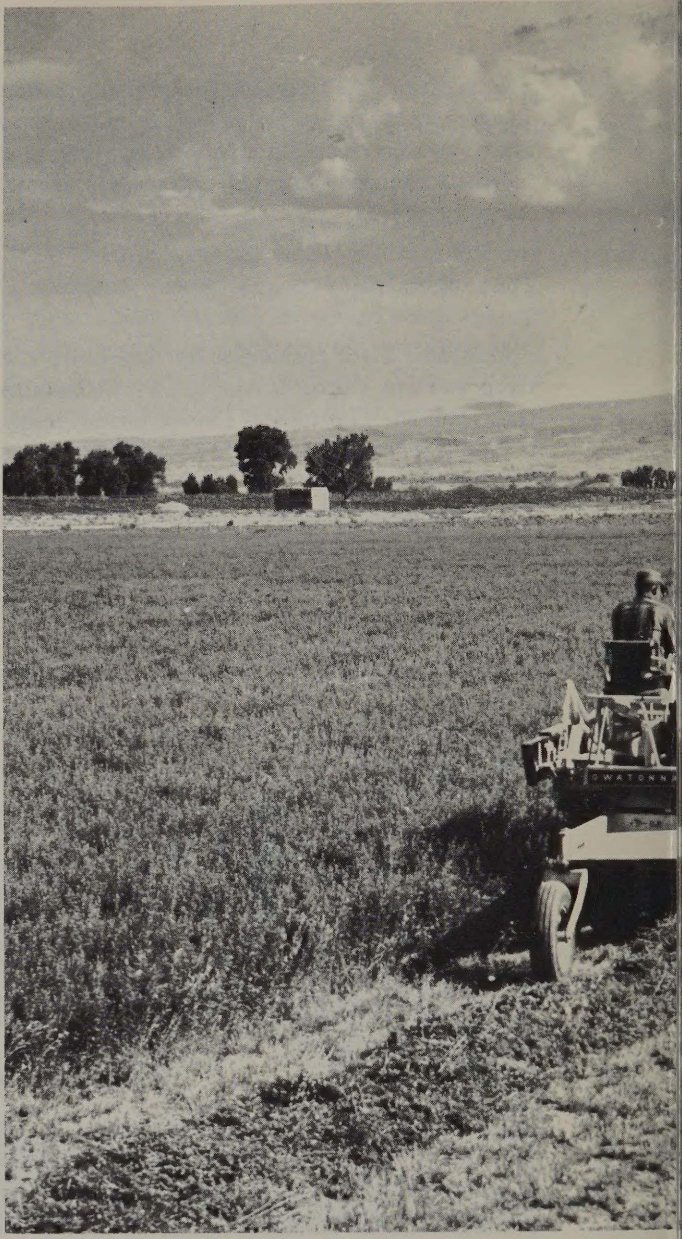
Production of Electric Energy

Production of electric energy in Colorado in 1960 amounted to 5,568,847,000 kilowatt-hours. This amount was 1.5 times the production of Powerplant of the Colorado Big Thompson kilowatt-hours in 1955, and three times the production in 1950.

The installed capacity of all hydroelectric plants in the State in 1960 was 252,892 kilowatts, 2.8 times that in 1950.

Commensurate with the continued growth of business in Colorado in general, the electric utilities also have experienced an increase in business. Additions to plants are being made continusously.

The Land Resources of Colorado



About 36 percent of the 103,884 square miles of land area in Colorado is owned by the Federal Government. Such land includes public lands or remnants of the old public domain which have always been in Federal ownership and lands purchased by the Federal Government.

Federal lands in Colorado are administered principally by the following Federal agencies: Bureau of Land Management, Geological Survey, Bureau of Reclamation, National Park Service—All Interior Department bureaus; the Forest Service of the Department of Agriculture; the Atomic Energy Commission; and the Department of Defense.

Public lands are used for a variety of purposes including grazing, timber production, wildlife habitat, recreation, production of minerals, and parks and forests.

Areas of public land are withdrawn from time to time for surveys, mineral leasing, public

(Above) The most modern farm machinery cuts, crimps, and windrows alfalfa from fields in the Grand Valley Reclamation Project of Colorado.

(Right) A lovely girl displays a basket of luscious Elberta peaches for which the Grand Valley in Colorado is famous, primarily as a result of the State's Grand Valley Reclamation Project.

waters, power reserves, stock driveways, and for land classification.

Agricultural Resources

Although the number of people engaged in farming and the number of farms in Colorado has declined steadily and rapidly over the years, the average acreage per farm has increased. The average farm in 1910 was about 293.1 acres; in 1960, just 50 years later, the average farm was four times as large, 1,161.6 acres.

Only 127,560 people in Colorado comprise the farm population—about 7 percent of the population. In Colorado, there are about 33,000 farms embracing some 39 million acres.

A farmer and his irrigator inspect the bumper sugar beet crop obtained in Reclamation's Colorado-Big Thompson Project near Greeley, Colorado. Latest methods of water control in this formerly arid section have made northwestern Colorado a fine truck-farming area.

The cash receipts from 1958 to 1960 averaged about $608 million, including livestock and livestock products. The livestock industry is a major one in Colorado, and Colorado ranks fourth in the Nation in production of sheep and lambs.

Other important agricultural commodities in Colorado are field crops, with sugar beets and broomcorn production ranking second in the Nation. Sudangrass seed, wheat, barley, sorghum grain, and rye also rank high.

Colorado also produces large quantities of high quality fruits and commercial vegetables. Chief among these are spinach, green peas, onions, beans, cucumbers, potatoes, lettuce, cauliflower, and cantaloupes.

The State is one of the leaders in the Nation in the development and use of agricultural irrigation water, which is used in every county except one. Weld County, located in the South Platte River Basin in northeastern Colorado, is consistently among the top 10 agricultural counties in the country.

Timber Resources of Colorado

Colorado's forest lands include nearly 20 million acres, or about one-third, of the State's area. About 7 million acres are privately owned. Most of the remainder is within Colorado's 12 National Forests, although the National Land Reserve supports a substantial timber cover.

Less than half of the forests are classified as commercial forests. Almost 12 million acres are noncommercial forests used primarily for grazing, recreation and warershed protection.

From the eight million acres of commercial forests—about 2 million acres of which are privately owned—more than 30 million cubic feet of timber are taken annually. Most of the timber is used in sawlogs—enough wood to build more than 16,000 average homes. Other products produced include pulpwood, railroad ties, mine timbers, telephone poles, and posts.

Almost all of the commercial timber in Colorado is softwood, mostly native lodgepole and ponderosa pine, Engelmann spruce, and Douglas-fir. Other species found are white fir, blue spruce, bristlecone pine, alpine fir, corkbark fir, and quaking aspen.

Fire protection is required on nearly all areas. About 88 percent is effectively protected at the present time, and fire losses in Colorado are not large. The greatest timber losses in the State are due to insects, weather, disease, and other causes. More than 3 million cubic feet of timber and growing stock were lost to these causes in a recent year.

Range Resources of Colorado

The range resources of Colorado are extensive. Including woodlands and forests that are used for grazing, about two-thirds of the land area of the State is used for grazing—almost 46 million acres.

Only about a million acres of the land used for grazing is cropland. Most of the rest is land that is too dry or rocky or steep to be cultivated. Surprisingly little land in Colorado is so poor that it cannot be used for grazing.

More than half of Colorado's range land is privately owned. The State itself owns about 3 million acres used for grazing, and the Federal Government owns a little more than 15 million acres.

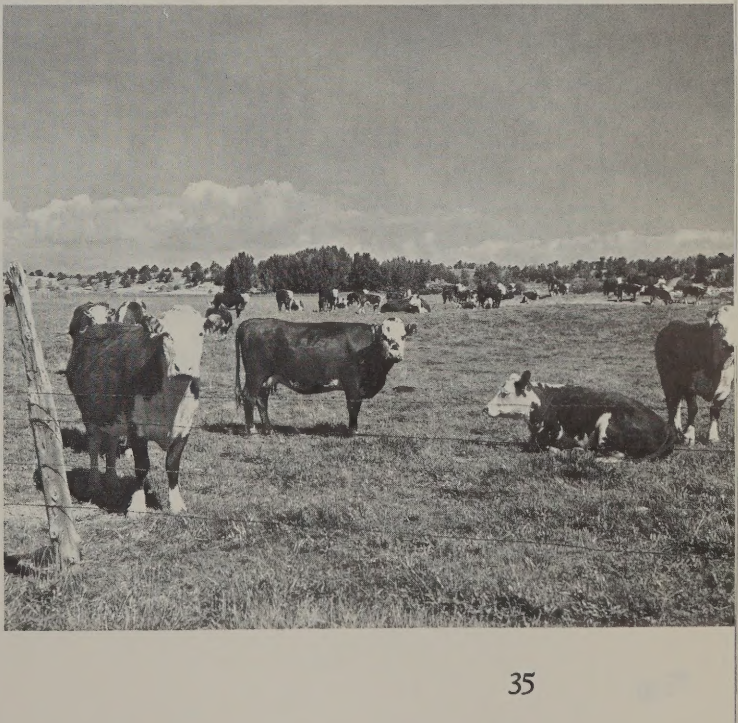
The bulk of the publicly owned rangelands are administered by the Bureau of Land Management. More than 7 million acres are within grazing districts established under the Taylor Grazing Act of 1934. Livestock owners are permitted to run their animals on the public lands for a certain length of time each year for a fee.

Livestock and other commercial animals in the State have a total value of about $70 million. This includes 1,675,000 cattle, 45,000 horses, 1,525,000 sheep, and about a thousand mules.

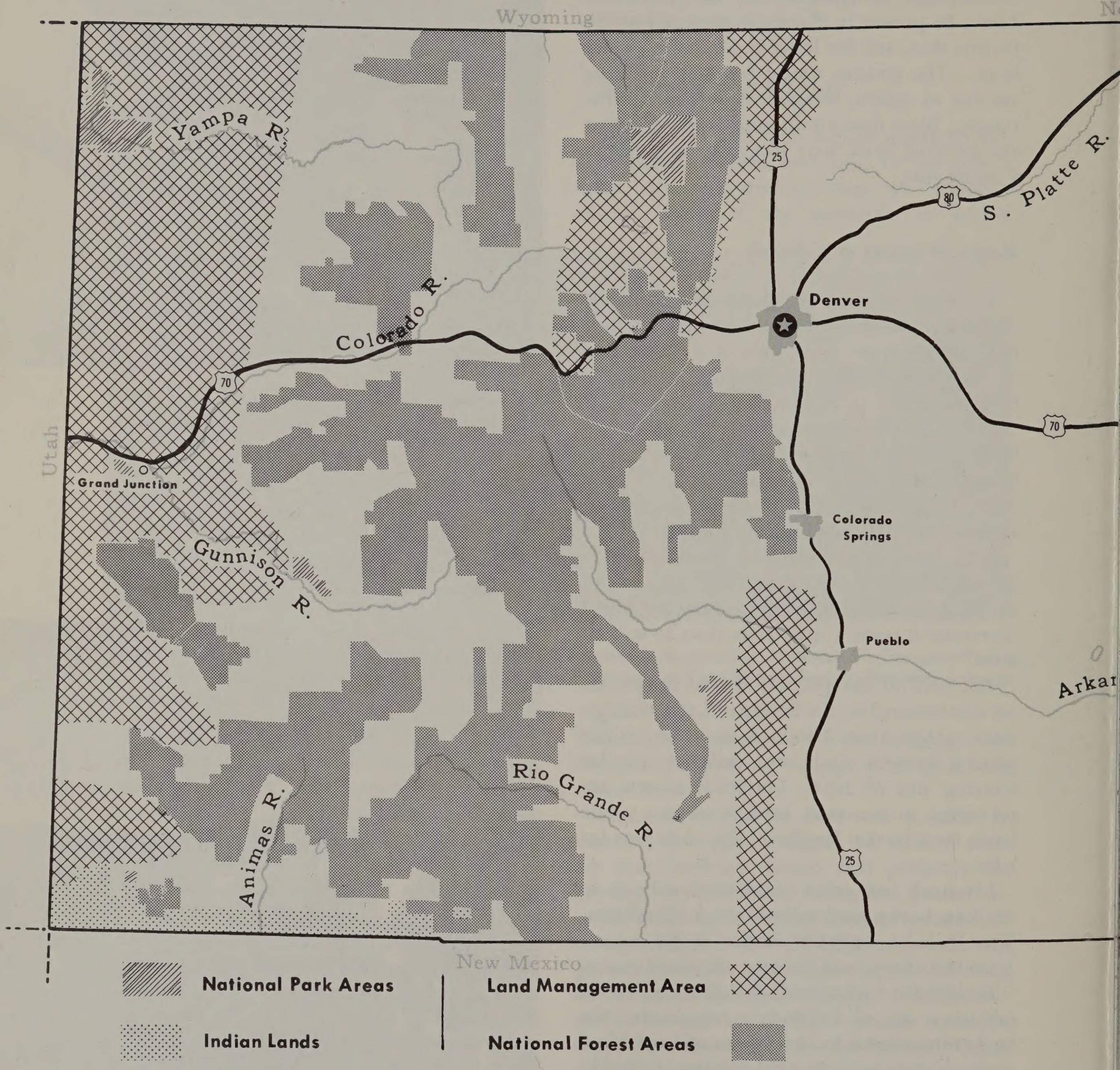
In addition to livestock, wildlife also makes extensive use of Colorado's rangelands. On lands administered by the Bureau of Land Management alone more than 345,000 deer, 4,400 elk, 5,065 antelope, and 200 mountain sheep graze at least part of the year.

Barren acres have been transformed into orchards producing high-value fruits by Reclamation's Colorado-Big Thompson Project.

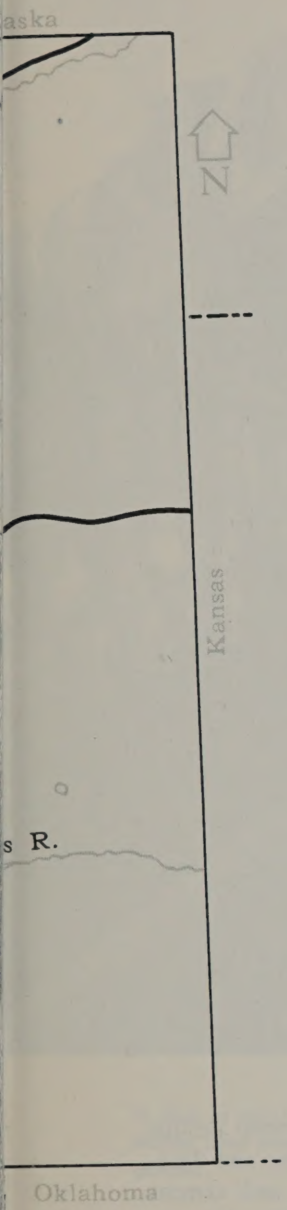
Cattle in Colorado form an important part of the State's agricultural resources.



Programs of Federal Natural


Wyoming
N
Yampa R.
25
80
S. Platte R.
Colorado R.
Denver
70
70
Utah
Grand Junction
Colorado Springs
Gunnison R.
Pueblo
Arkar
Rio Grande R.
Animas R.
25
New Mexico
National Park Areas
Indian Lands
Land Management Area
National Forest Areas

Resource Agencies



Resource Facilities

Geological Survey

Denver Field Office
Public Inquiries Officer
468 New Customhouse
Denver 2, Colo.

Management Officer
Denver Federal Center
Denver 25, Colo.

Geologist in Charge
Denver Federal Center
Denver 25, Colo.

Durango Field Office
P.O. Box 1809
Jarvis Building
125 West 10th Street
Durango, Colo.

Grand Junction Field Office
Box 551
Petroleum Building
1129 Colorado Avenue
Grand Junction, Colo.

Bureau of Indian Affairs

Superintendent
Consolidated Ute Agency
Ignacion, Colo.

Bureau of Land Management

State Office
Bureau of Land Management
677 Gas and Electric Building
910 15th Street
Denver 2, Colo.

Land Office
Bureau of Land Management
700 Gas and Electric Building
910 15th Street
Denver 2, Colo.

Denver District Office C–2
Bureau of Land Management
214 Old Customhouse Building
Denver, Colo.

Craig District Office C–1 and 6
Bureau of Land Management
Wyman Building
P.O. Box 248
Craig, Colo.

Canon City District Office C–5 and 8
Bureau of Land Management
1005 Main Street
Canon City, Colo.

Durango District Office
Bureau of Land Management
Jack Lee Building, 1211 Main Avenue
Durango, Colo.

Grand Junction District Office C–7
225 Post Office Building
Grand Junction, Colo.

Montrose District Office C–3
Bureau of Land Management
Smith Building, 301 North Cascade Avenue
P.O. Box 419
Montrose, Colo.

Bureau of Mines

Chief, Denver Administrative Service
Bureau of Mines
224 New Customhouse
Denver 2, Colo.

Mineral Resources Office, Area V
Bureau of Mines
Building 20, Denver Federal Center
Denver 25, Colo.

Denver Mining Research Center
Bureau of Mines
Building 20, Denver Federal Center
Denver 25, Colo.

Denver Coal Research Laboratory
Bureau of Mines
Building 20, Denver Federal Center
Denver 25, Colo.

Health and Safety District H
Bureau of Mines
P.O. Box 15037
Lakewood 15, Colo.

Rifle Oil-Shale Project
Bureau of Mines
Box 792
Rifle, Colo.

National Park Service

Black Canyon of the Gunnison National Monument
Box 438
Fruita, Colo.

Colorado National Monument
Box 438
Fruita, Colo.

Dinosaur National Monument (Colo.-Utah)
Room 12, Cooper Building
91 West Main
Vernal, Utah

Great Sand Dunes National Monument
Box 60
Alamosa, Colo.

Hovenweep National Monument (Colo.-Utah)
Mesa Verde National Park
Colo.

Rocky Mountain National Park
Estes Park
Colo.

Shadow Mountain National Recreation Area
c/o Rocky Mountain National Park
Estes Park, Colo.

Yucca House National Monument (Not open to the public)
c/o Mesa Verde National Park
Colo.

Bureau of Reclamation

Office of Chief Engineer
Building 53, Denver Federal Center
Denver 25, Colo.

Regional Office
Building 46, Denver Federal Center
Denver 25, Colo.

Curecanti Unit Office
P.O. Box 179
Gunnison, Colo.

Morrow Point Field Division of Curecanti Unit Office
524 First Street
Montrose, Colo.

Durango Projects Office
P.O. Box 640
Durango, Colo.

Florida Construction Division of Durango Projects Office
1124 Main Avenue
Durango, Colo.

Transmission Line Field Division of Flaming Gorge Unit Office
66 Anvil Points, RR 1
Rifle, Colo.

Grand Junction Projects Office
P.O. Box 780
Grand Junction, Colo.

Collbran Field Division of Grand Junction Projects Office
P.O. Box 307
Collbran, Colo.

San Luis Valley Project Office
P.O. Box 430
Monte Vista, Colo.

Denver Development Office
Building 46, Denver Federal Center
Denver 25, Colo.

Fryingpan-Arkansas Project Office
P.O. Box 515
Pueblo, Colo.

South Platte River Projects Office
P.O. Box 449
Loveland, Colo.

Mineral Resources of Colorado

In the early days, Colorado's mineral wealth came principally from gold, silver, and lead. Later, zinc, copper, coal, clays, and cement became major products, and in the last 30 years petroleum, natural gas, molybdenum and uranium have come to the forefront.

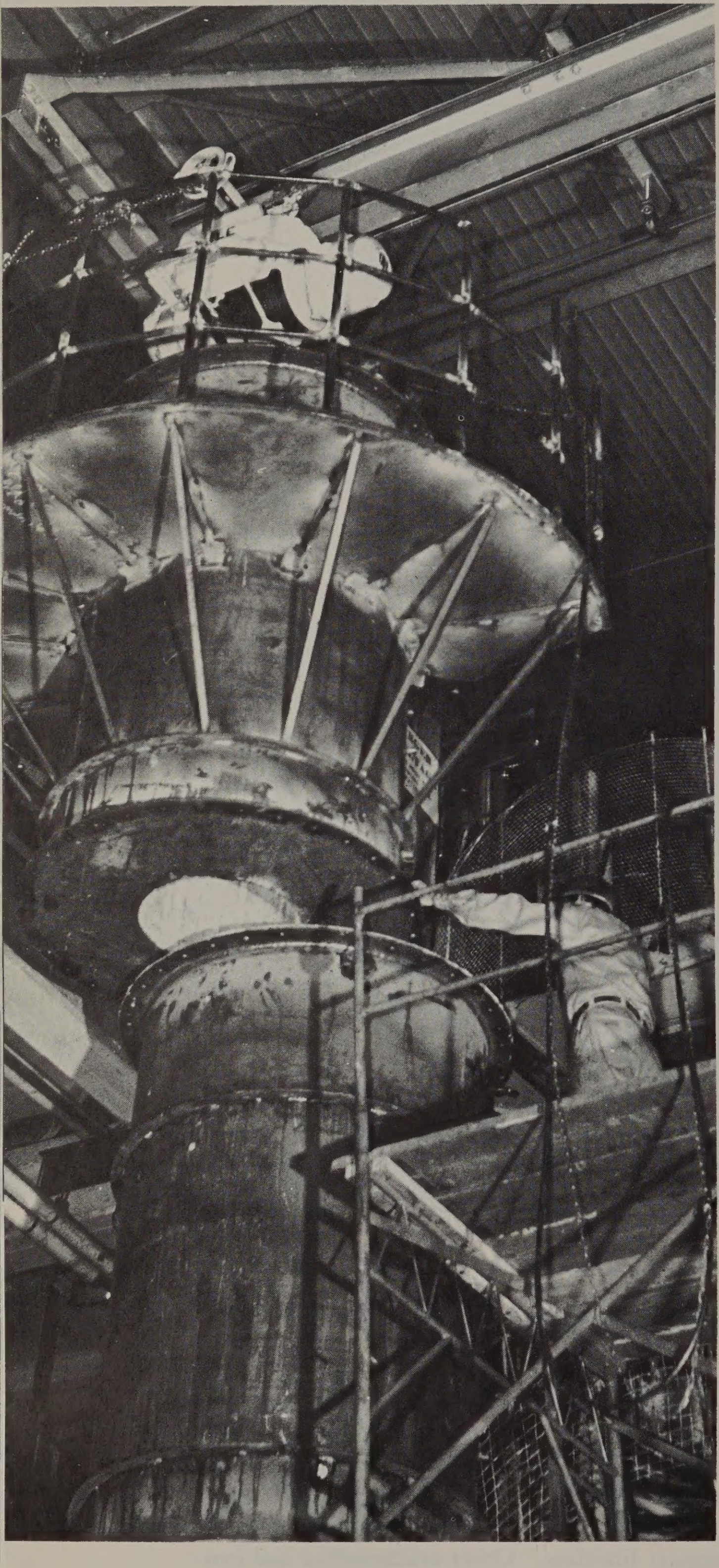
Colorado has thus far produced $7 billion in mineral wealth, and this total is at present increasing at the rate of about $350 million per year. The State stands 17th in the Nation in

A line of ingot molds at right ready to be filled with molten steel from the open-hearth furnaces in the background.

Molten iron from a Pueblo, Colorado, blast furnace pours into the open top of a basic oxygen furnace where it will be converted into steel.

the value of its annual mineral output. Of the total, about 43 percent has come from petroleum and coal and related products; about 21 percent has come from gold and silver; about 13 percent has come from the ferroalloys—molybdenum, vanadium, and tungsten; about 10 percent has come from the base metals—lead, zinc, and copper; about 2 percent has come from uranium; and about 11 percent has come from minor metals nonmetallic minerals, and construction materials.

Colorado's reserves of stone, sand, and gravel appear limitless. Other nonmetallics and low-



grade ores of many metals also are plentiful, although some of the richer metallic ores now are nearly exhausted.

Fuel Resources

Vast reserves of bituminous coal—greater than those of Pennsylvania—and oil shale, the largest deposit on this continent, assure the future of fuel extracting and processing industries in Colorado for centuries to come. Both coal and shale can be processed, when necessary, to make liquid fuels, tars, gases, and various chemicals. However, for the next two or three decades, proved reserves of petroleum, natural gas, and metallurgical coal are sufficient to sustain present production levels, supplying Colorado's own needs and helping to meet those of neighboring States.

Mineral Economy

The geographic base of Colorado's mineral economy is unusually wide. Coal fields abound in both northern and southern counties. Oil and gas are found in the plains and foothills east and west of the Rockies. Historically, metals have been most plentiful near the central spine of the Continental Divide. However, most of the State's 62 counties report production of several different minerals.

Construction materials are found almost everywhere. Sand and gravel are produced in 59 counties and stone is quarried in 32. Coal is mined in 16 counties, clay in 10, uranium in 22.

The precious metals and copper, zinc, and lead—in different combinations and mineral compounds—are produced in varying quantities in more than a score of counties. Only urban Denver, the capital city and county, reports no mineral production, but its five refineries process nearly twelve million barrels of petroleum annually.

Petroleum and Natural Gas

Petroleum is Colorado's most valuable single

Carbonization processes for transforming coal into coke, tar, and a variety of gasses and chemicals are constantly under study by the Department of Interior's Bureau of Mines at its Denver Coal Research Laboratory.

mineral product, averaging close to 50 million barrels a year. Natural gas production is increasing and the various natural gas liquids—chiefly natural gasoline—and liquefied petroleum gases such as propane and butane are produced in greater profusion each year.

The Rangely oilfield in Rio Blanco County and the Adena field in Morgan County together produced more than half the petroleum reported for the entire State in 1960. At least 16 other counties shared in the remaining output.

Bituminous Coal

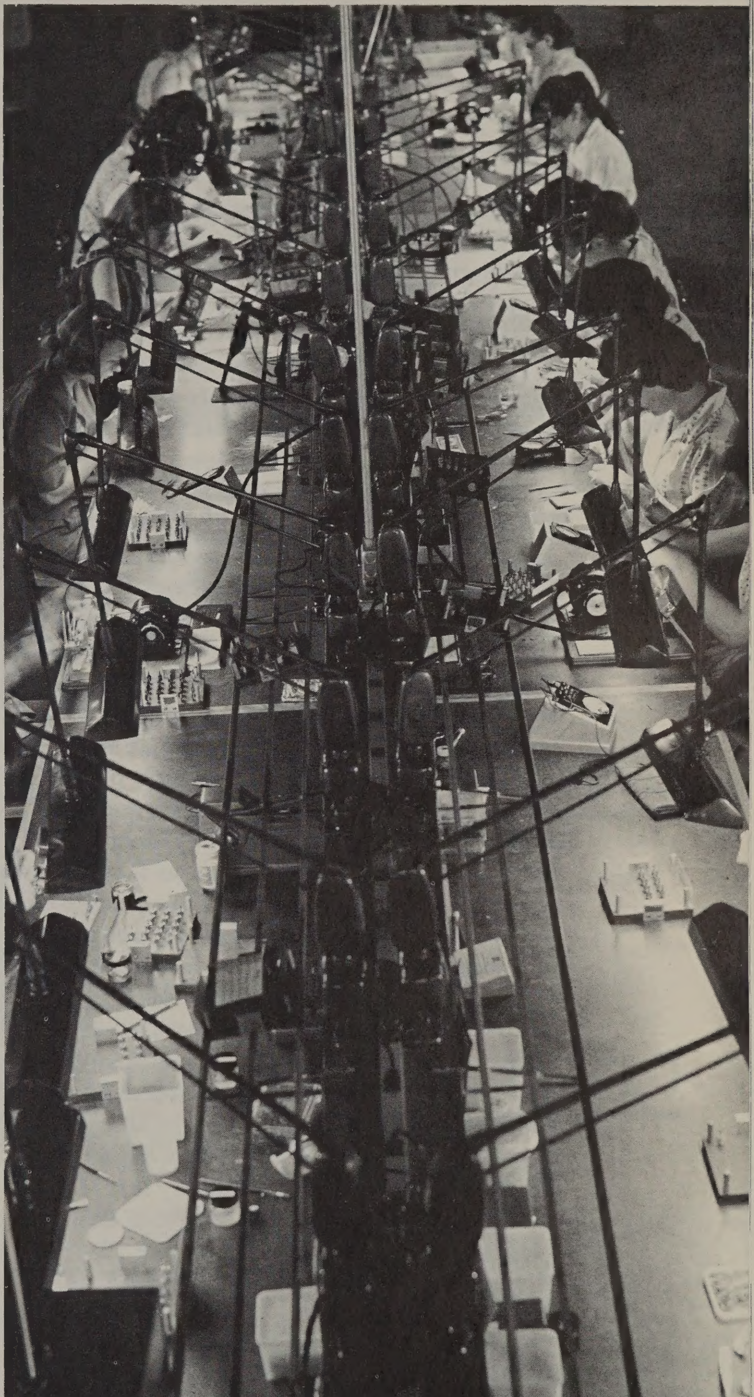
Metallurgical coal from Colorado's southern coalfield is shipped to a steel mill at Geneva, Utah, or consumed within the State at a steel plant in Pueblo. The rest of the State's coal output, recently averaging well over 3 million tons, is marketed chiefly within the State for generation of electric power or heating. Production is holding steady at 3.5 million tons annually and is expected to grow as power consumption increases.

Oil Shale

Northwestern Colorado contains the greatest accumulation of oil shale in North America. Some technicians claim that methods already devised and tested could mine and process this rock to obtain products substantially equivalent to those that could be recovered from about a trillion barrels of petroleum. Costs are such however, that large-scale commercial production is not expected in the near future.

Other Mineral Products

Carbon dioxide is produced as a gas along with natural gas or oil in certain wells and often is wasted to the air. Two plants, in Bent and Montezuma Counties, now process carbon dioxide from wells in Las Animas and Montezuma Counties, and market it as dry ice and as liquid carbon dioxide. Peat production in Boulder, Gilpin, and Teller Counties is increasing but it is being used only as an admixture in fertilizers or as a soil conditioner.



Workers on the assembly line of the Western Division, Clifton Precision Products Company put together a rotary component called a synchro. The highly industrial region around Pikes Peak lists skilled workers as its most important "natural resource."

The annual value of uranium output in 18 Colorado counties is slowly rising, now averaging over $23 million. Even so, much of the uranium processed in Colorado comes from the Four Corners area and is mined in Utah, Arizona, and New Mexico.

Ores that once were mined for vanadium are now being mined for their uranium content. But the vanadium also is recovered as a byproduct. Colorado, therefore, continues to supply the great bulk of the world's vanadium, and production of this metal rises each year as more and more uranium ore is processed for atomic-energy uses. Vanadium is important for its use in making steel alloys.

The only active molybdenum mine in the United States and the world's largest known deposit of molybdenum ore are near the town of Climax, Lake County, not far from Leadville. All other molybdenum now produced in the United States and most of the relatively small Free World production outside this country is obtained as a byproduct in mining and processing other metals. The mine at Climax achieved a record output of 11.6 million tons of ore in 1960 and continued to work at capacity through 1961. (Total value of the molybdenum metal and other products fell, however, as the ore was of lower grade.) Molybdenum has promise for use as a high-temperature metal. It is employed in making high-speed steels and other alloys.

The famed "lodes" of Colorado's high Rockies still are yielding substantial quantities of gold, silver, copper, lead, and zinc, more than a century after their discovery. In 1960 there were about 70 "lode" mines operating in 22 counties. Total value of their output was over $18 million, of which $8 million was for zinc. San Miguel and Eagle Counties share the bulk of this production, while Mineral and Teller Counties produce over a million dollars worth in an average year.

Beryllium minerals, with potential for use in rockets, missiles, jet aircraft, and nuclear energy, are mined and shipped as concentrate from eight counties. Cadmium, indium, and thallium are recovered from flue dust and other byproduct materials processed in a smelter at Denver. Tungsten is mined and milled in Boulder County and both tungsten and tin are obtained as byproducts of molybdenum mining and processing. Production of brown iron ore, or limonite, remains small but is increasing rapidly.

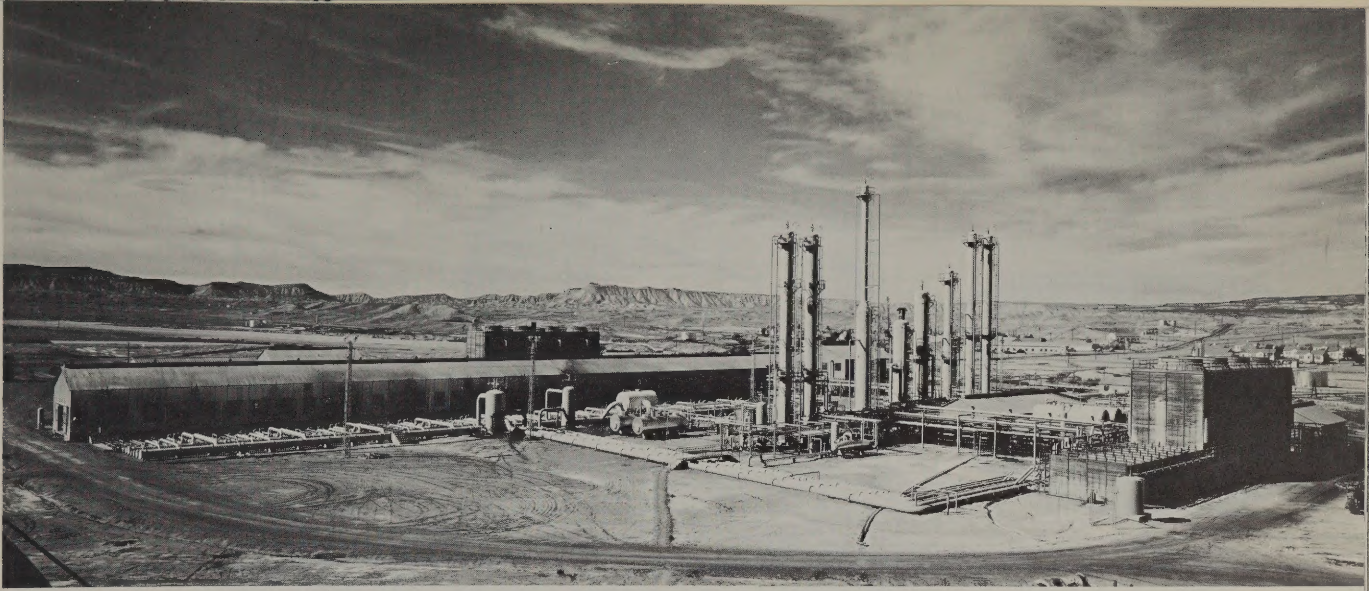
Non-Metallics

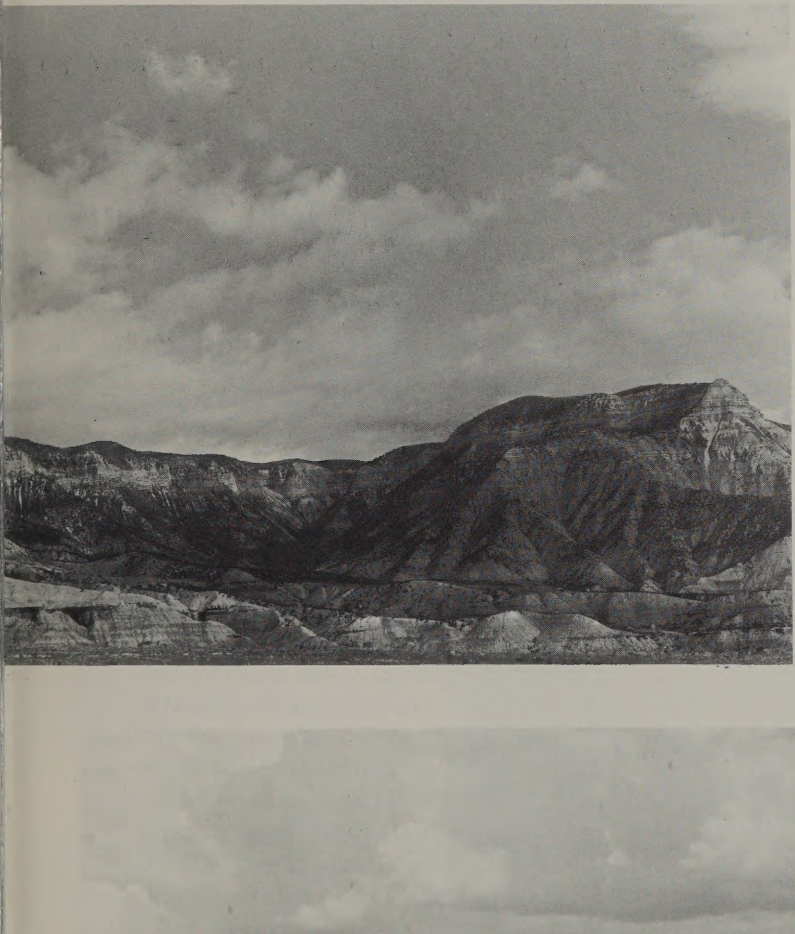
Fireclays and miscellaneous clays worth more than a million dollars annually are mined in 10 Colorado counties. Cement is made at plants in Fremont and Larimer Counties from local materials. Shale is processed to make a lightweight aggregate for concrete at Rocky Flats, south of Boulder. Fluorspar is produced in Boulder County and feldspar in Chaffee County. Other nonmetal products of Colorado include gem stones, gypsum, lime, mica, perlite, pumice, pyrites, and salt.

The basic construction materials, stone, sand and gravel, are found in most parts of the State.

Stone quarries in 32 counties have an annual production valued at between $4 and $5 million. Limestone, used in manufacturing cement and also for steelmaking, is the most valuable, followed by granite, sandstone, marble, and basalt.

Enough sand and gravel to supply local needs is produced in every county except Denver, Costilla, and Hindsdale. Output has varied recently between 19 and 21 million tons.

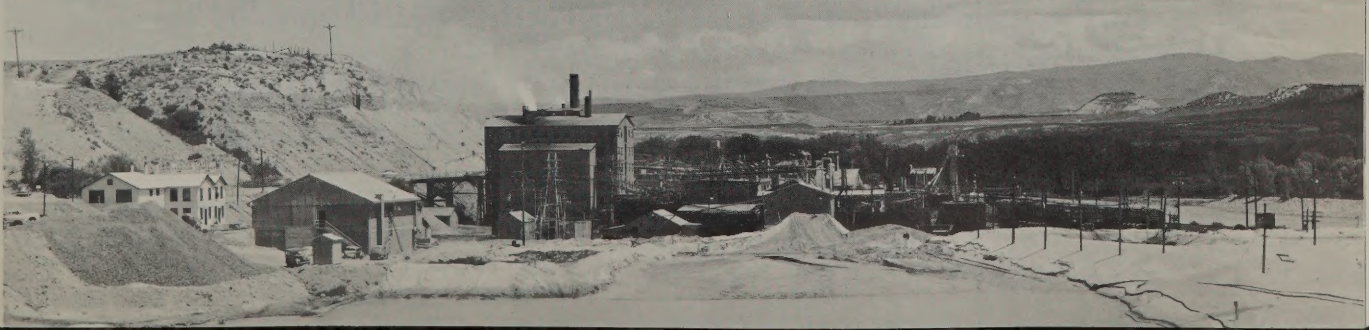


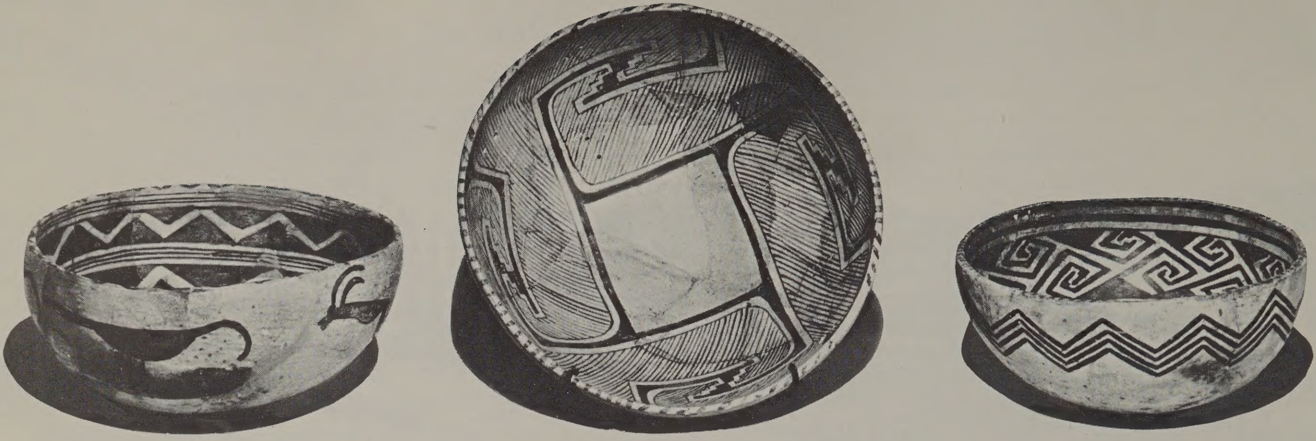


(Above) The American Gilsonite Company, Fruita, Colorado, makes gasoline and other motor fuels and electrode carbon from gilsonite, mined at nearby Bonanza, Utah. The gilsonite is mined hydraulically and transported in a pipeline as slurry to the plant shown here.

(Left) Typical oil shale rocks line a Colorado highway. Of great potential use to man, these shales occur in large accumulations in northwest Colorado, and may some day be used to offset crucial petroleum shortages.

(Below) Colorado is rich in many mineral resources. A U.S. Vanadium Company plant in Rifle processes ore from the Four Corners area, producing both vanadium and uranium.





The Indians of Colorado and Their Resources

The mountain-dwelling Ute Indians of Shoshonean stock appear to have been the only indigenous tribe of the State. There were others, however, who came to occupy the mountains and the plains, pressed on by stronger people behind them. Chief among the tribes of the plains were the Cheyenne, Arapaho, Comanche, and Kiowa. Frequent, but less permanent, residents of the Colorado plains were the Pawnee, Sioux, Kiowa-Apache and Plains Apache, the Lipan. Crow and Blackfoot war parties sometimes penetrated from the north as far as the South Platte River. Some Navajo dwelt along the banks of the Rio San Juan in southwestern Colorado, and the Jicarilla Apache occasionally entered from New Mexico and Arizona.

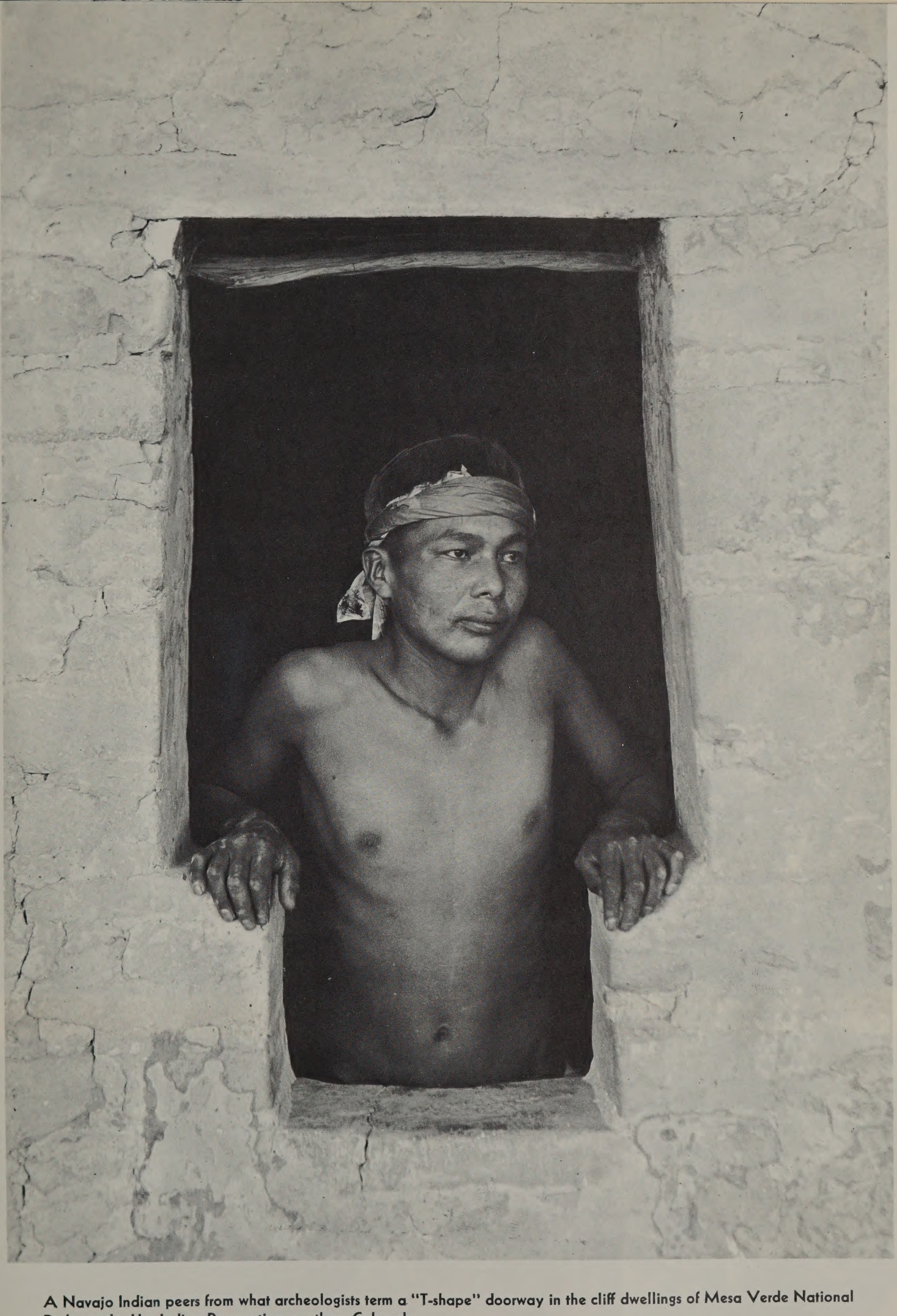
Today two groups of Utes—Southern and Ute Mountain—occupy adjoining reservations in the southwestern corner of Colorado, with lands extending into New Mexico. Another branch of the original Ute Tribe occupies the Uintah-Ouray Reservation in northeastern Utah.

Lands

The area of Indian trust lands in Colorado is relatively small and is located on the two adjoining Indian reservations in the southwestern corner of the State. The Southern Ute Reservation is situated wholly in Colorado and consists of nearly 300,000 acres of tribal land and about 5,000 acres owned by individual members of the tribe. The Ute Mountain Reservation contains about 450,000 acres in Colorado and 107,000 acres in New Mexico, all of it tribally owned.

Minerals

Oil and gas development represents virtually all of the mineral activity on the two reservations. Although gas has been produced on Colorado Indian lands since the 1920 period, oil



A Navajo Indian peers from what archeologists term a "T-shape" doorway in the cliff dwellings of Mesa Verde National Park, on the Ute Indian Reservation, southern Colorado.

and gas development has had its greatest expansion following World War II in connection with the general oil and gas development in the Four Corners area. There are approximately 230 oil and gas leases in effect which cover about one-half of the area of the two reservations.

Timber

The Southern Ute Reservation is the only Indian land area in Colorado having commercial forest resources. It contains 25,741 acres of commercial timberlands that support a net volume of 120 million board feet of sawtimber. Ponderosa pine makes up 95 percent of the commercial volume. The remaining 5 percent is principally Douglas-fir and White-fir. In addition, there are 125,370 acres of noncommercial timberlands on the Southern Ute Reservation, supporting 29 million board feet of pinon pine and juniper trees.

The Ute Mountain Reservation has no commercial timber, but has 167,761 acres of noncommercial timberlands with an estimated volume of 42 million board feet, consisting mainly of pinon pine and juniper trees.

Irrigation

Within the Indian reservations of Colorado, the Bureau of Indian Affairs is operating one major irrigation project, Pine River, with an ultimate irrigable area of approximately 17,000 acres and several small irrigation systems which serve only a few hundred acres.

The Bureau is also cooperating with the Bureau of Reclamation on projects which, if constructed, will bring under irrigation an additional 22,000 acres of Indian land.

The rehabilitation of the irrigation system for the Pine River project is now under way. When completed, the operation and maintenance responsibilities will be transferred from the Government to an acceptable water users organization.

The water resources associated with Indian trust lands comprise one of the most valuable of Indian assets. The population growth and the continuing expansion of the non-Indian irrigation in this area have made the control of water supplies subject to acute competition. To protect this valuable asset of the Indian through full development of the land and water resources is one of the major aims of the Indian Bureau.

Range Resources

Over 91 percent of the Indian land in Colorado is classified and used as range for the grazing of Indian-owned livestock (1,300 cattle; 6,400 sheep). The range land is tribally owned and is used free by tribal members.

The two tribes, through their programs, are assisting in development of the range resources and often provide tribal funds to augment Government funds for range improvements such as brush control, reseeding, fencing, and the like.

Recreation Resources

The Southern Ute tribal members have recognized the income-producing potentialities of well planned tourist developments on their reservation and recently, opened their lands to public hunting for the second time in history. They are also cooperating with the Fish and Wildlife Service to increase their fishery management program. Planning for other recreation potentials is under consideration.

(Top Right) Visitors inspect a restored defense area in Balcony House, a cliff dwelling in Mesa Verde National Park, Colorado.

(Bottom Right) Remains of the Cliff Palace, an ancient cliff-dwelling of prehistoric Indians in Mesa Verde National Park, Colorado, as seen from the south.

Geologic Sketch

The rocks and soils of Colorado's plains, mountains, and plateaus provide a record of geologic history at least a billion and a half years long. As with human history, this record is poor and scanty in its early part but becomes clearer and more detailed as the present time is approached.

Ancient rocks comprise a large part of the mountain ranges in Colorado. The two main kinds of these rocks are granite and gneiss, a banded rock with a granitelike grain and durability. These rocks, once some miles within the Earth's crust, can be seen now because of the erosion of vast quantities of covering rock. Gneiss is the older of the two rocks having been invaded by the granite. The granite is not all of the same age, but modern methods of radioactive dating indicate that most of it is 1 to 1½ billion years old. A long period of destructive erosion followed the period of granite formation, and in some places, such as in the northwestern and southwestern corners of the State, waste products of this process are preserved as thick bodies of sandstone, shale, quartzite, and slate.

Approximately a half billion years ago, about the time of the earliest fossils, a great change occurred in the pattern of geologic events. At that time, Colorado was part of a vast flatland that lay close to sea level. The sea spread over this flatland repeatedly through an interval at least 250 million years long, each time leaving a new layer of fossil-bearing limestone or sandstone as a record of its transgression. This pattern of geologic calm ended with the rise of mountains in an extensive area that corresponded only in part with the mountains of today. Great quantities of sand, gravel, and mud were washed from these mountains and deposited along the coasts of bordering seas, forming thick layers of sandstone, conglomerate, and shale—many of them reddish in color—which are now exposed in or along the mountain ranges. A little later, similar deposits accumulated on land, along with vast blankets of dune sand.

About 125 million years ago, the sea returned for the last time and left a layer of mud and sand thousands of feet thick over the whole State. This material, now shale and sandstone, underlies the plains portion and large areas in the western part of Colorado. Great swamps existed along the borders of the retreating sea, and vegetable matter that accumulated in these ultimately became coal.

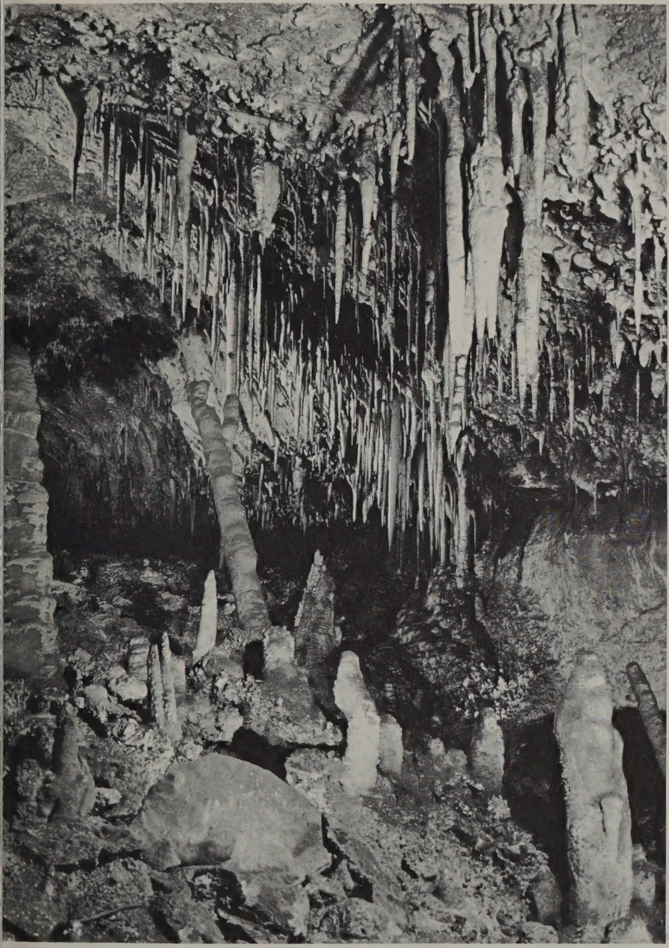
Most of the mountains of the present Colorado landscape came into existence 60 to 75 million years ago, when, in response to forces within the earth, they bulged upward, breaking and distorting the flat-lying deposits of ocean and stream that had once occupied their site.

In many places, molten rock rose toward the surface at the same time, and emanations from the molten masses gave rise to most of the great ore deposits for which Colorado is famed.

Later, thousands of square miles in the mountains were buried beneath lavas from many great volcanoes, and the Plains were buried beneath a blanket of alternating volcanic ash and sand and gravel washed from the mountains. Still later, the mountains were re-elevated, and in the cold of the Ice Age, many of them were cloaked by glaciers.

The Colorado landscape seen today is a product of long-continued change. The glaciers that sculptured the mountains have only barely vanished, and the streams that cut away valleys and canyons are still carving.

During the prolonged construction and modification of the region now included within the State, many unusual geological features were formed. Among the resulting marvels are the huge caves and passages which honeycomb Colorado National Monument in Mesa County. Erosion produced the fantastic volcanic formations of Wheeler National Monument in the south-central part of the State where cones, massive plugs, and red pinnacles tower above majestic gorges. The great shifting sand dunes in the San Luis Valley are the remnants of a prehistoric desert.



(Above) The awesome and beautiful Rocky Mountains—through which runs the Continental Divide—form the backbone of Colorado's geography.

(Left) Mysterious Temple of Silence, showing magnificent stalagtites and stalagmites. This is one of nineteen rooms in the Cave of the Winds of Williams Canyon, six miles from Colorado Springs.

(Below) Looking down the Pine River from a highway bridge, in the Pine River Reclamation Project, at Bayfield, Colorado.

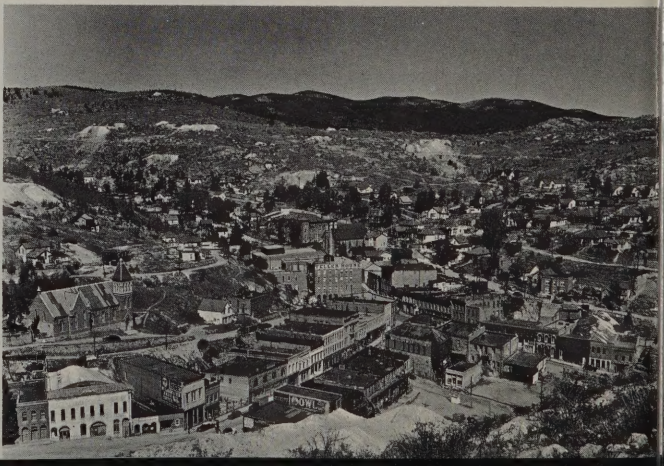
Cities of Colorado

(Right) The University of Colorado Campus and the City of Boulder are situated at the foot of the Rocky Mountains. The City of Boulder owns over 4,000 acres of mountain park and recreation lands.

(Below) Denver, the mile-high city, is the hub of Colorado's economic life, lying in the foothills of the Rocky Mountains. In the right foreground is the State Capitol.

(Middle Right) Ouray, in the Uncompahgre Plateau of Colorado, a gold, silver, and copper mining region, is also a mineral springs resort.

(Right) Central City, Colorado, the first bonanza gold-mining town in rich Gregory Gulch, is noted for the Teller House, a remnant of the gold-rush days.



Programs of Federal Natural Resource Agencies

The State of Colorado is rich almost beyond belief in a wide range of natural resources. The wise use and protection of such endowments long have been the concern of natural resource agencies of the Federal Government. The following pages describe some of these programs and interests.

U.S. Army Corps of Engineers Programs

Although it is a regularly constituted branch of the United States Army, with extensive military engineering and construction responsibilities, the Corps of Engineers also is actively engaged in planning and building projects for flood control and water conservation, one of its primary civil functions under Federal law.

In its civil works, the Corps of Engineers functions on a river basin basis, whenever possible integrating into a comprehensive plan such features as flood control, hydroelectric power, navigation, irrigation, water supply, stream pollution abatement, recreation, and other related water uses.

Floods on Colorado's rivers are caused by sustained, high-volume snowmelt; by heavy rains of cloudburst intensity; or by combinations of the two.

At the same time, water is a scarce and coveted resource in considerable portions of the State where irrigation is the key to successful crop production. The growth of population and industry inevitably brings ever-increasing demands for water conservation.

John Martin Reservoir Project

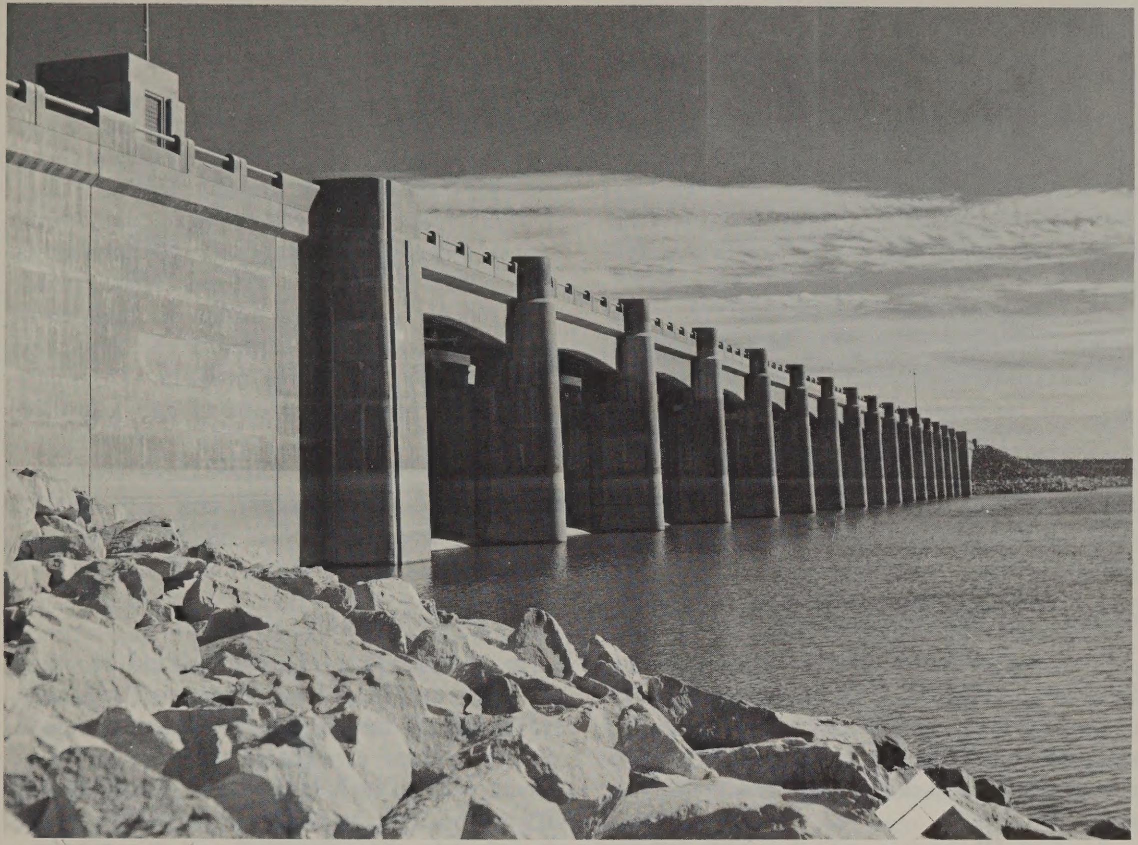
The first improvement for water resources development built by the Corps of Engineers in the State of Colorado is the John Martin Reservoir project, which also has the distinction of ranking largest in the State with regard to storage capacity. The dam spans the Arkansas River about 58 miles upstream from the Colorado-Kansas State line. The reservoir, extending over 14 miles up the valley and covering almost 18,400 acres at maximum pool level, stores and regulates the floodwaters from a mountainous and rolling-hills drainage area of 18,915 square miles. Recreational facilities that attract visitors from all directions, including the neighboring State of Kansas, are centered around Lake Hasty, a small permanent lake which has formed from the accumulation of ground water in a borrow pit just downstream from the dam.

Congress, realizing the urgent need for both the control of costly floods and the conservation of water for irrigation of the fertile Arkansas River Valley, authorized construction of the Caddoa Reservoir project in the Flood Control Act of 1936. The name was changed to the John Martin Reservoir project by the War Department Civil Appropriation Act of June 1940, in honor of the late Congressman John A. Martin of Colorado.

Work on the dam was begun in the fall of 1939; however, operations were suspended from 1943 to 1946 during the war because of critical material and labor shortages, and the project was not actually completed until October 1948.

Total reservoir storage capacity at maximum pool elevation (3,870 feet above mean sea level) is 645,500 acre-feet, based on estimated sediment depletion since the latest survey in 1957. About 278,500 acre-feet of this capacity is reserved for flood control, and the remaining 367,000 acre-feet is utilized for irrigation water supply storage.

The effectiveness of the John Martin Reservoir project for both flood control and conservation has been demonstrated many times. Since it was placed in operation, eight floods have originated on the watershed above the dam. Recent and therefore vivid in the minds of Arkansas Valley residents was the disastrous flood of May 1955 which inundated over 30,000 acres of urban and farm lands along the main stem downstream from Pueblo before its rampaging waters were halted by the John Martin Dam. Major flooding also occurred in the tributary Purgatoire River Valley in addition to minor flooding from the other tributaries in that area. The near-record floods caused damages of more than $4 million—a figure which would have been more than doubled had the dam not been in place to catch the



The floodgates of the John Martin Dam hold back more than a quarter million acre-reet of Arkansas River water, in Colorado's largest capacity storage reservoir. Completed in 1948, the dam prevents floods and stabilizes downstream flow for irrigation purposes.

entire flood volume of 260,000 acre-feet of water. Regulated releases from the dam during the following growing season benefited the farmers and ranchers by making water available for irrigation of drought-stricken lands.

It is estimated that flood damages of $18,871,000 have been prevented in the States of Colorado and Kansas by the John Martin Reservoir project since its construction. At the same time, operation of the project to provide a more stable and supplemental water supply to downstream users has provided cumulative irrigation benefits of $13,256,000. This compares with total Federal cost for construction of the project of some $15 million.

Additional Returns

Under the reservoir management plan, project lands surrounding the reservoir are leased to various individuals for grazing and agricultural purposes, and to nonprofit organizations for recreational purposes. By law, 75 percent of all money received by the Federal Government from the leasing of public lands, acquired for project purposes, is returned to the State or States in which a reservoir project is situated to be expended as the State Legislature may prescribe, in defrayal of the expenses of government of the county or counties in which such a project is located.

Lake Hasty, with a surface area of approximately 75 acres and a maximum depth of 12 feet, offers ideal conditions for those who enjoy water sports, since the water level remains fairly constant. The recreational area developed by the Corps of Engineers for public use includes the following improvements: fencing, access roads, parking area, picnic tables and fireplaces, water supply system, fishing pier, bathing beach, diving platform and pier, and sanitary facilities. On the north shore of the reservoir a floating boat dock and walkway have been constructed. An overlook and picnic shelter have been located on a promontory west of the dam. The Boy Scouts, Girl Scouts, and the Southeastern Colorado Recreation Association have established camp areas in the vicinity.

It was originally estimated that the recreational facilities would probably attract about 8,000 visitors annually; however, actual attendance has far surpassed all expectations. This is demonstrated by the fact that attendance for the period of operation has averaged about 166,400 visitors annually since 1950. In 1962, some quarter of a million persons visited the project.

Cherry Creek Dam and Reservoir

Completed in 1950, Cherry Creek Dam and Reservoir is located some 6 miles southeast of Denver on the creek from which the project takes its name. Its primary purpose is to protect Denver from the flash floods that occur on Cherry Creek.

An earth-fill structure, the dam rises 140 feet above the stream bed and is 14,300 feet long. The project was initially operated as a dry reservoir but in 1958, at the request of the Governor of Colorado, 10,000 acre-feet of storage was impounded for conservation purposes. Later, because of the growing popularity of the pool as a sports area, an agreement was executed between the State and the Corps of Engineers providing approximately 15,000 acre-feet of storage for conservation, leaving a reservation of 70,000 acre-feet for flood control and 10,000 acre-feet for sedimentation. Total storage capacity of the reservoir is 95,000 acre-feet.

At the request of irrigators along the South Platte River downstream from Cherry Creek, the reservoir is operated in such a manner as to have a minimum effect, consistent with its primary function, on the junior water rights downstream.

The "Master Plan for Reservoir Development, Cherry Creek Reservoir" was issued in April 1959. The entire project area, except for the dam and structures, is under lease to the State of Colorado for park and recreational purposes. The Corps has completed construction of a hard-surfaced main entrance drive, and the Colorado State Park and Recreation Board and the Game and Fish Department are installing extensive facilities for boating, water skiing, parking, picnicking, water supply and fishing access. Public acceptance of the developing recreational facilities is evident in the attendance records of the area. Begun in 1959, these records show 168,700 visitors for the balance of 1959 and 399,324 visitors in 1960. The figure is now in the neighborhood of half a million annually.

The total cost of the Cherry Creek project to the Federal Government was $14,768,000. Average annual benefits of $1,757,000 are attributable to the protective works.

Other Projects

In addition to several channel and floodway projects, the Corps has underway or scheduled a number of investigations of proposed flood protection and water conservation projects. These studies include areas on the Colorado River and its tributaries, on the South Platte River and tributaries, and on the Arkansas River.

The studies are closely coordinated with State and local officials and with other Federal agencies. Overall coordination among all Federal and State agencies working to develop land and water resources of the Missouri and Arkansas River basins is accomplished through the Missouri Basin Inter-Agency Committee and the the similarly constituted Arkansas-White-Red Basins Inter-Agency Committee, respectively. For the Colorado River Basin, coordination is accomplished through the Pacific Southwest Inter-Agency Committee.

The development of natural resources is receiving constantly increasing attention by the people of the State and their local and Federal agencies. This is contributing to the industrial, urban, and agricultural growth of Colorado.

(For futher information concerning Corps of Engineers programs and projects in Colorado, write for "Water Resources Development", U.S. Army Engineer Division, 215 North 17th Street, Omaha 2, Nebr.)

Fish and Wildlife Service Programs

The banding of Canada geese on Colorado wildlife refuges is an important conservation tool in managing migratory waterfowl.

The Fish and Wildlife Service has several major installations in Colorado. These include:

The Monte Vista National Wildlife Refuge which is located in the San Luis Valley in the south-central part of the State. It contains approximately 10,500 acres and another 800 acres are leased. The primary purpose of the refuge is to create suitable nesting habitat for migratory birds and, at the same time, to provide food and protection for wintering waterfowl.

The proposed *Alamosa National Wildlife Refuge* will also be located in the San Luis Valley. Its proposed area is 9,500 acres. This refuge is expected to have considerable value as a duck and goose nesting area. It will also be an important wintering area for mallard ducks.

The Leadville National Fish Hatchery is a major unit in the National Fish Hatchery System, producing approximately 100,000 pounds of trout annually. These trout are stocked in the waters of Colorado in cooperation with the Colorado Game and Fish Department. Trout produced are rainbow, brook, brown, and black-spotted cutthroat. This hatchery is located in the central part of the State.

The Creede National Fish Hatchery is a small unit producing trout fingerlings for stocking alpine lakes and feeder streams in five National Forests in the southern part of the State. This hatchery also carries out spawn taking operations for the rare black-spotted cutthroat trout. Plans are underway to maintain a trout brood stock at this station which will eventually produce from 7 to 10 million eggs annually for use at this and other National Fish Hatcheries.

The proposed *Curecanti National Fish Hatchery* is authorized under the Colorado River Storage project. As proposed, this hatchery would produce about 100,000 pounds of rainbow trout or other species of cold water fishes annually for stocking reservoirs and tailwaters of the Colorado River Storage project. This new hatchery would be located near Gunnison.

The Denver Wildlife Research Center carries out most of the wildlife research work of the Fish and Wildlife Service west of the Mississippi River. This work includes studies of animal damage control methods, forest wildlife management, effects of pesticides on wildlife, and migratory bird ecology and diseases.

The Fish-Pesticide Research Laboratory, located at Denver, conducts research needed to predict and prevent damage to fishes from exposure to pesticides. Hundreds of tests involving selected pesticides and various kinds of fishes have been conducted by this research laboratory.

River Basin Studies are conducted by the Fish and Wildlife Service to determine the effects of water development projects on fish and wildlife and to recommend measures to protect and improve these resources. In Colorado, this work is carried out by a field office in Denver. These studies include the Curecanti Unit of the Colorado River Storage project. This unit calls for the construction of two and possibly three dams on the Gunnison River which is nationally known for its outstanding trout fishery. The Curecanti National Fish Hatchery has been proposed as one way to mitigate the loss of trout spawning areas in the Gunnison as a result of these impoundments.

Forest Service Programs

The Forest Service of the Department of Agriculture works in three major fields that affect the resources of Colorado: Administration of National Forests and National Grasslands; cooperation with the State Forester in programs for management and protection of State and private forest lands; and research in forestry, range management and related fields.

National Forest Administration

The Regional Forester in Denver administers 11 national forests and two national grasslands in Colorado through the respective forest supervisors and their staffs. Another national forest extends into Colorado from Utah, but is administered by the Regional Forester in Ogden.

The national forests of Colorado cover a gross area of 15,188,000 acres of which 13,710,000 acres are federally owned. They are located on the mountains and high plateaus throughout the State west of the Great Plains.

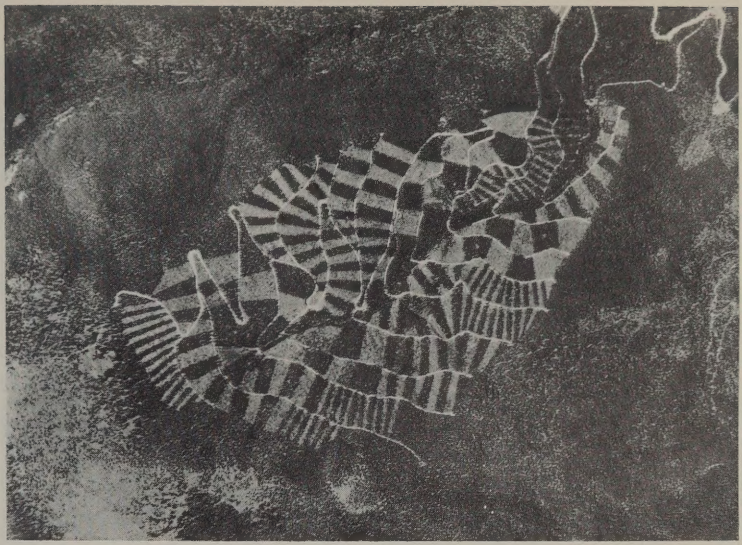
The Comanche and the Pawnee National Grasslands, totaling 627,000 acres, are located in the Great Plains section of Colorado. They consist primarily of badly deteriorated agricultural lands that were purchased by the Government under several emergency programs, were rehabilitated, and are now being managed under multiple use management principles.

The national forests are managed for a sustained yield of their many renewable resources and benefits. They are the primary source of nearly all of the usable water in Colorado, since their boundaries include the high mountain watersheds which receive the heaviest precipitation. They also include nearly all of the 8 million acres of commercial forest, essential summer range for 166,000 head of cattle and 506,000 sheep, some of the best hunting areas and fishing streams, and recreation opportunities that draw more than 10 million visits annually.

In recent years, the many uses of the national forests increased at such a rate that it became imperative to intensify management and protection activities to avoid serious deterioration of resources and facilities. The Forest Service has embarked on a "Development Program for the National Forests," aimed at developing and managing all resources to meet the demands anticipated by 1972 and including long-term planning for the year 2000.

In terms of on-the-ground work the development program will mean: Construction of 2,920 new camp and picnic areas and related facilities; planting 175,000 acres to trees; revegetation of 194,000 acres of depleted range; construction of 1,183 miles of fence and 524 water developments; and many other major protection measures and resource improvements. A thorough analysis of all range allotments is underway, and an inventory of the total forest

(Left) Nearly 506,000 sheep graze annually on National Forest Land. These sheep crop grass in Maroon Creek Valley, White River National Forest, largest of Colorado's National Forests. Headquarters are at Glenwood Springs.



(Right) Resembling an Indian sand painting, this aerial view shows the Fools Creek Watershed in the Frazer Experimental Forest after experimental timber harvesting. Timber was clean-cut from 278 acres, increasing the streamflow of Fools Creek by 200 acre-feet a year.

recreation resources has been completed.

State and Private Cooperation

The Regional Forester and the State Forester cooperate in a number of programs designed to promote better management and protection of State and private forest land. These programs include: Forest and range fire prevention, forest fire control, forest pest control, tree planting, forest management, flood prevention, watershed protection, and rural area development. The State Board of Agriculture administers these programs, while the Forest Service provides financial, planning, and technical assistance. In areas with large amounts of national forest land, Forest Service personnel work directly in some of these programs. Cooperative conservation programs are also carried out through local Soil Conservation Districts and Agricultural Stabilization and Conservation Committees.

Tangible evidence of Forest Service cooperative activities is seen in the State Forest Service Nursery at Fort Collins, in the State forest fire control organization which protects more than 7 million acres, in a pilot flood prevention project and two small watershed projects, and in forestry and forest industry aspects of rural development projects in six counties. Cooperative work has also helped in the planting of shelterbelts throughout Colorado's Great Plains area. The cooperative program most familiar to the general public is the forest fire prevention program, known to most people simply as Smokey Bear. He speaks to millions of people daily from posters, newspaper ads, and on radio and television.

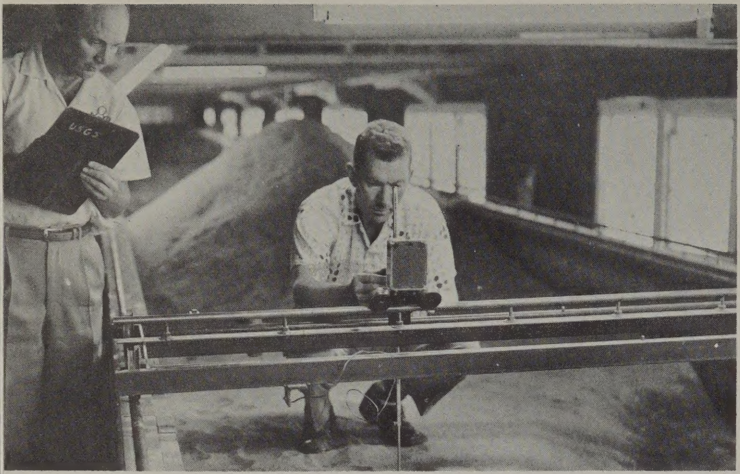
Forest and Range Research

The Forest and Range Experiment Station at Fort Collins conducts research at the Station headquarters and several experimental forests and ranges in the State. Research directed from Fort Collins is solving problems common not only in Colorado, but in the entire region.

Of particular importance to Colorado is the research work in watershed management. By experimentally cutting timber in different patterns and blocks, research scientists have learned how to increase the snow pack and to reduce loss of water through evaporation. This same research also discovers new ways to prolong the snowmelt into the critical summer months.

Research has shown ways to improve range management. Cattle can be distributed more evenly over the range by careful location of fences and water developments. More vigorous growth of grass can be achieved through rest rotation grazing and new methods of eradicating undesirable range plants. Research also contributes to more effective rodent control and more successful revegetation methods.

Other research programs carry on the never-ending fight against forest insects and diseases, seek improved methods in firefighting, study wildlife habitat, forest regeneration, and timber management.



Constant investigations by Geological Survey hydrologists, working in cooperation with Colorado State University, give new knowledge of water flows which is useful in proper development of the State's water resources.

Geological Survey

Beryllium is an important new lightweight metal which has potential applications in aircraft, missiles and atomic reactors. Departmental geologists using portable detectors are inventorying Colorado's beryllium deposits.

Scientists of the Department's Geological Survey conduct a large number of geologic, geophysical, geochemical and water resources studies, accomplishing topographic and geologic mapping and exercising supervisory control over mining operations on public lands in Colorado.

The Water Resources Division of the Geological Survey determines and appraises the quantity and quality of Colorado's water resources, conducting studies required for the economical development and best use of both surface and ground water.

Investigations are planned specifically to obtain water information needed to solve major water problems relating to distribution, supply, chemical quality, sediment load, and conservation.

Ground water data is studied for development of industrial, municipal, and agricultural water supplies. Investigations of sediment transported by streams determines the effect of sediment on reservoir storage, diversion works and irrigation systems.

Research is conducted on various phases of the hydrologic cycle, including the effect of land-use practices on runoff, evaporation losses from reservoirs, and the use of water by different kinds of vegetation. Studies of soil and moisture conservation practices include reconnaissance of sites for obtaining stock water by drilling wells, developing springs or constructing reservoirs.

Daily records of river stage and discharge are obtained at 290 river measurement stations in Colorado.

Geologic Mapping, Geophysics and Research

Many detailed geologic studies are concerned with particular areas known or suspected to contain useful minerals, such as the Leadville, Creede, Summitville, Kokomo, Rico, and Central City mining districts containing base and precious metals; the Poncha Springs fluorspar district; several uranium mining districts in the Colorado Plateau area; thorium-bearing rocks in the Wet Mountains and in Gunnison County; the Lake George beryllium-bearing area; the Trinidad and Carbondale coal fields; and oil shale deposits in Piceance Creek basin, in the Uinta basin, and in the Grand Mesa-Battlement Mesa area.

Geologic mapping and detailed studies of earth materials provide valuable data to aid the planning of urban developments as well as major construction projects. Current studies include work in the Denver and Pueblo areas, at the Air Force Academy, the Roberts and Straight Creek tunnels, the Black Canyon of the Gunnison River, and the Upper Green River Valley.

Other geologic studies to obtain fundamental data are underway along the eastern front of the Rocky Mountains in the vicinities of Golden, Kassler, Littleton, Platte Canyon, Morrison, and Ralston Buttes; in the San Juan Mountains, the Ute Mountains, Cameron Mountain, Mount Princeton, and North Park. A synthesis is being made of much detailed geologic mapping in the Colorado Plateau in recent years to better understand and summarize the regional geology. Stratigraphic and paleontologic studies throughout the State support all of these studies.

Geophysical studies are in progress in several areas. These include long seismic refraction profiles across the southern Rocky Mountains and along the High Plains, gravity studies across the southern Rocky Mountains, and of the Colorado Plateau and Upper San Juan trough, and aeromagnetic and aeroradioactivity studies in the vicinity of Rocky Flats.

Geochemical investigations underway in the State include studies of minor elements in igneous rocks, rock alteration and enviromnents associated with ore deposition, saline minerals associated with evaporites, rare-earth minerals, uranium and vanadium minerals, and the formation and redistribution of uranium deposits.

Some of the work discussed above is supported in part by funds made available through the Colorado Metal Mining Fund Board. Information on other geologic work in progress in Colorado may be obtained from that agency and the Colorado Department of Natural Resources in Denver.

Typographic Mapping

The State of Colorado contains some of the first areas to be mapped by the Geological Survey, shortly after the Survey's formation in 1879. Even in those early years the importance of Colorado's mineral resources and natural wonders led men of vision to carry out topographic surveys for geologic exploration and future development. By 1890 these early surveys, carried out at the 1:125,000 scale (1 inch equals about 2 miles), covered over 17 percent of the State. These maps served their purpose in the early development of Colorado but are now only useful for the roughest reconnaissance work.

Aided by a vigorous State cooperative program an expanded mapping program has been carried out in recent years to complete the mapping of the State to 1:24,000-scale standards by photogrammetric methods. This detailed mapping will aid in geological and mineral investigations, in studies for water development and flood control projects, in developing modern highways, in locating potential industrial sites, in planning wildlife conservation and developing new recreation areas.

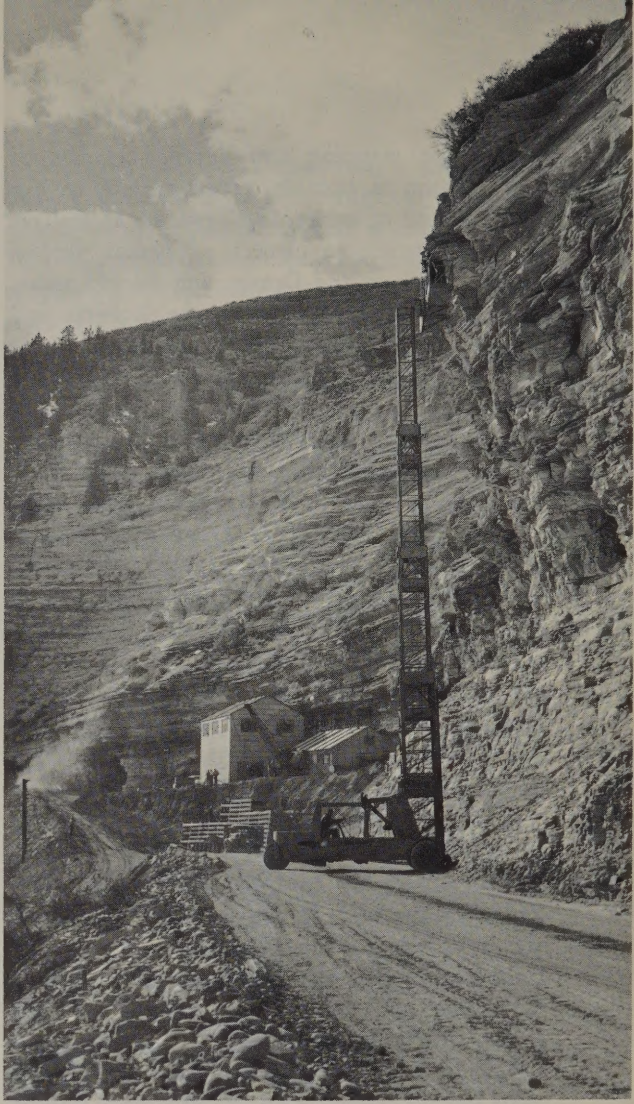
Mineral Resource Supervision and Classification

The Geological Survey exercises supervisory control over mining activities concerned with prospecting and production of minerals under permits and leases on public, Indian, and acquired lands. For land classification purposes, geologic mapping is underway on the coal deposits in four or five areas in the central and western parts of the State. The quadrangle maps resulting from this mapping constitute additions to the Geologic map of the United States.

The Survey supervises operations for the discovery, development, and production of oil and gas from leases on Federal and Indian lands in Colorado. It promotes exploration and recovery of oil and gas by the most economical means with due regard to conservation, elimination of waste, protection of other mineral deposits, and protection of the interests of the United States or of the Indian lessors.

Information on the various geologic and topographic maps, mineral resources maps, water resources reports, and other geological survey publications relating to Colorado can be obtained by writing the Director, Geological Survey, Department of the Interior, Washington 25, D.C.

Bureau of Mines Programs



The Bureau of Mines of the Department of the Interior has many programs in Colorado, all designed either to develop the diverse mineral resources of the State or to promote safety and healthful working conditions—particularly in the mineral industries.

To accomplish these objectives the Bureau works closely with State officials, with labor, and with management. It conducts research, inspects mines, controls fires in inactive coal deposits, collects statistics, and gives training courses in mine safety and accident prevention. All of its major activities within Colorado are directed from Denver but Bureau programs that affect Colorado are also conducted at major research and testing centers outside the State.

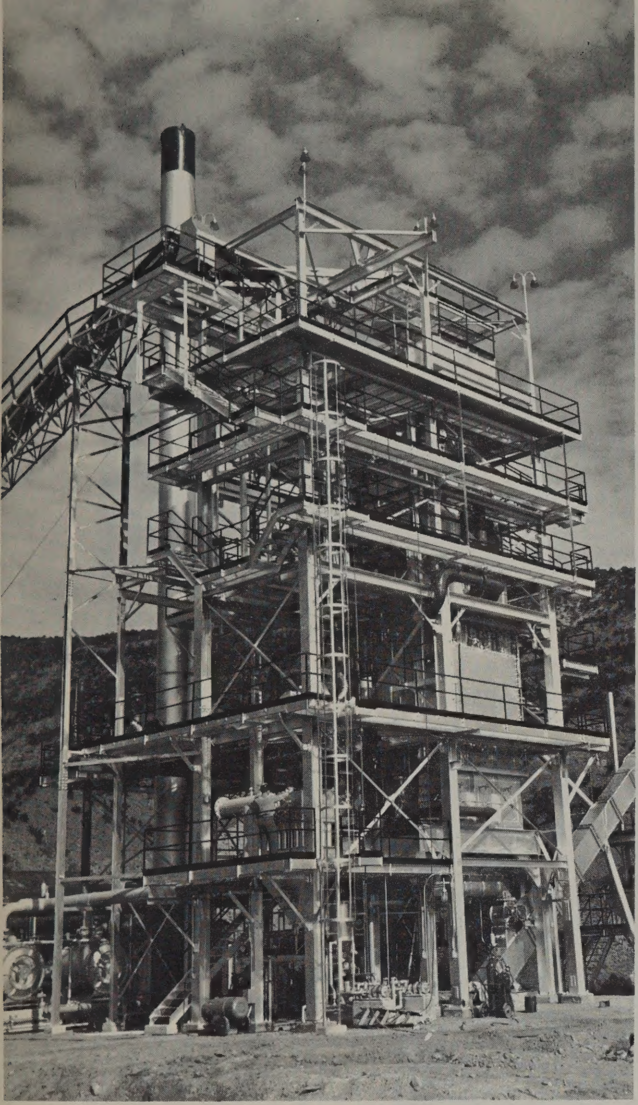
Mineral Resource Studies

Bureau studies of Colorado's mineral resources show how they fit into the broad picture of the Nation's needs. Location and extent of the great fuel resources—coal, natural gas, petroleum, and oil shale—are generally well-known today as a result of past Bureau investigations. Many recent projects have been designed to correct specific basic deficiencies in the national inventory, providing data on resources that must meet future needs of both the civilian economy and of national defense. Bureau mining and petroleum engineers continually update estimates of reserves of each mineral.

New instruments and new techniques used by the Bureau have provided new and more accurate information about the metallic and nonmetallic mineral resources of the State. Much more is now known about tellurium and such other exotic metals as beryllium, columbium, tantalum, cesium, rubidium, and the metals of the "rare-earth" group. Iron ore deposits have been reevaluated, as have the State's deposits of complex minerals combining traces of the precious metals (gold and silver) with ores of the base metals (copper, zinc, and lead). Scores of prospector's samples are examined each year, and, as a further aid, the Bureau continually publishes studies of methods and costs of mining in the State. A field and laboratory survey of refractory clay resources in Colorado has been completed and is being extended to neighboring States. Technical-economic studies of potential power-generating sites are being conducted in the coal fields of Weld County.

Mining Research

Scientists of the Denver Mining Research



Bureau of Mines' Petroleum Research Center conducts studies on the feasibility of obtaining oil from shale deposits in northwest Colorado. Both mining techniques and distilling retorts (right) have been tested near Rifle, Colorado.

Center specialize in two general areas. The larger group is concerned with the development of engineering principles and mathematical techniques applying to exploration, development, and operational problems in mining metals and nonmetallic minerals other than coal. Research by this group includes methods of ore sampling, analysis of mining systems, and applications of statistics to problems in estimating ore reserves. The other group specializes in the study of rock characteristics and behavior with particular emphasis on ground control. Its research includes laboratory investigations to determine how rock behaves under the strains imposed by mining, and field investigations—in cooperation with mining companies of the area—to evaluate stress-strength relationships of rock in operating mines.

Coal Research

Pilot-plant and bench scale studies at the Denver Coal Research Laboratory are chiefly devoted to finding new uses for the solid fuels of Colorado and adjoining States. Colorado's coking (metallurgical) coals are being tested more precisely than ever before and carbonization assays are being made in experimental carbonizers to develop knowledge concerning the effects of variations in size and shape of retorts and reaction chambers. Samples of coal from newly opened mines are constantly being analyzed to determine physical and chemical properties and thus either broaden or increase the depth of knowledge of the region's coal resources. Tars made from these and other coals are studied for new uses, and the formation of new carbon chemicals from coal tars and coal gases is investigated.

Petroleum, Oil Shale, and Metallurgical Research

Laboratory research on petroleum, natural gas, and oil shales of Colorado takes place largely at the Bureau's Laramie (Wyo.) Petroleum Research Center. Studies of exploration, drilling, and shale mining are conducted in the oilfields and the shale deposits.

In many laboratories throughout the Nation, the Bureau conducts metallurgical research on methods of treating or processing the metallic minerals of Colorado.

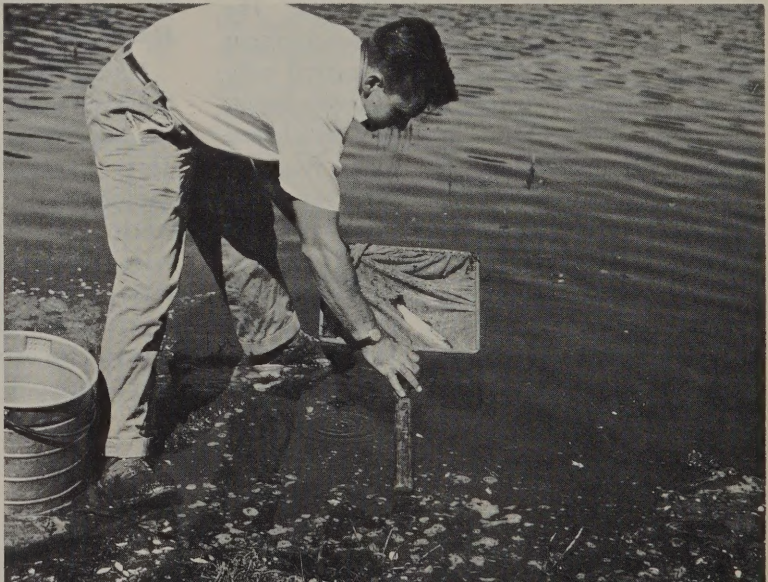
Health and Safety Activities

Bureau of Mines safety engineers inspect Colorado's coal mines as required by Federal law and visit other mines to investigate fatal accidents or explosions when requested by State authorities or by mine operators. Mine inspectors and Bureau safety representatives also visit mines, oilfields, and other mineral industries to conduct safety and first-aid training courses for both workers and supervisors. The Bureau also carries on a program for controlling fires in inactive coal deposits.

The Department of the Interior's Bureau of Indian Affairs is expanding educational opportunities for Indian children and adults. This little Ute girl is selecting a book from the modern library at the Russell Todd Elementary School near Fort Duchesne, Colorado.

Bureau of Indian Affairs officials confer with Ute Indians near Ignacio about proposed tribal enterprises to develop Indian resources.

The Southern Ute tribal members of Colorado have recognized income-producing potentialities of well-planned tourist developments. Fishstocking on the Ute Mountain Reservation, in cooperation with the Department's Fish and Wildlife service, is included in the program of improved fishery management.



Bureau of Indian Affairs Programs

In addition to its resource development and conservation activities on Indian lands, the Bureau of Indian Affairs of the Department of the Interior also provides the Indian people on reservations with services in the fields of education and training, welfare aid and counselling, and law enforcement.

Education

Most of the Indian children from the Ute Mountain and Southern Ute Reservations attend public schools. Of a total enrollment of 367 students during the 1960–61 school year, 344 were in public school, 21 in Federal schools, and 2 in mission schools.

The Bureau operates a dormitory at Ignacio for over 200 Ute and Navajo children enrolled in the nearby public schools. Financial aid is extended through contracts with two public school districts enrolling the dormitory residents and other local Indian children.

An adult education program has been organized at Towaoc with primary emphasis on improved academic skills, business practices, improved home living and useful leisure time activities. A new activity of interest is the revival of Ute basketry.

The Southern Ute and Ute Mountain Tribes are assisting their youth through scholarship aid for higher education. Agency school census reports for these groups showed 14 students attending colleges and non-Bureau vocational schools during fiscal year 1961.

Employment Assistance

In Denver, the Bureau has one of the eight field offices which it maintains in larger cities throughout the West and Middle West to assist Indians in training for and finding employment opportunities.

A trained staff at this office assists Indians from many reservations throughout the country (including those in Colorado) by providing guidance and counseling services in job placement, in locating suitable housing and in adjusting generally to urban life away from the reservations. Those who have the necessary skills are usually employed immediately; many of those who lack these skills are enrolled at Government expense in vocational schools for training prior to job placement. Through the Denver office the Bureau now has contracts with nine schools to provide vocational training for Indians in 20 different courses.

Welfare

The Bureau has a welfare program on the Southern Ute and Mountain Ute Reservations in southwestern Colorado. A social worker is stationed at the Consolidated Ute Agency with headquarters in Ignacio. In addition, the Mountain Ute Tribe employs a social worker who is stationed at Towaoc.

The Ute tribes have considerable tribal income from natural resources on the reservation, principally oil and gas, and in 1962 each member of the Southern Ute Tribe received $700 divided into monthly payments while each member of the Ute Mountain Tribe received 12 monthly installments totaling $1,575. Advice and counsel are given by the social workers to the families, when necessary, in planning constructive use of their own and their children's funds. Other social services are provided to Indians with family problems or any other serious social problems.

Child welfare services are provided on both reservations, including supervision of foster home placements, planning for adoption, and securing appropriate institutional care for handicapped children through the State and private agencies.

Law Enforcement

The Bureau furnishes the Ute tribes with technical help in conducting their law enforcement activities on the reservations.

A BLM range conservationist pauses to discuss range conditions with a permittee high in the Colorado Rockies. Below, some 2,000 sheep are en route to their summer range 12,000 feet above sea level.

Bureau of Land Management Programs

Lands administered by the Bureau of Land Management in Colorado amount to more than 8 million acres—lands referred to as a "vital national reserve."

More than 7 million of the acres are within grazing districts established under the Taylor Grazing Act of 1934. That act and ensuing Executive Orders were the instruments by which the lands were reserved from indiscriminate settlement and use. The lands were not "closed," however, for the national land reserve in Colorado is used not only for grazing, but for timber production, wildlife habitat, recreation, and production of minerals.

The Bureau of Land Management not only administers those activities on the national land reserve, but is responsible for the surveying and marking of the land and classification according to the highest and best use. Their responsibility extends to timber management, range improvement, protection against fire, insects, and disease, construction of roads, bridges, and water control devices, orderly disposition of the land, and maintenance of the public land records.

Land Offices and Use

These functions are accomplished by a State Director and his staff in an office in Denver, six district offices located in Craig (with a suboffice in Meeker), Denver, Montrose, Durango, Canon City and Grand Junction, and a Land Office in Denver where all land records for the entire State are maintained.

The largest part of the national land reserve in Colorado is best suited for grazing for livestock and wildlife. Over one-half million sheep and almost 200,000 cattle and horses grazed on the national land reserve during 1961. Grazing is regulated under the Taylor Grazing Act.

When range is allotted, provision is made also for wildlife. Approximately 328,000 deer, 4,500 elk, 3,200 antelope, and 200 mountain sheep utilized the public domain at least part of the year in 1961.

A fee of 19 cents per animal unit month is charged for the privilege of grazing on the national land reserve. Cattle count as one unit, horses as two, sheep as one-fifth unit. More than $150,000 was collected during 1961 from grazing fees of which $12,600 was returned to the State. The rest of the money collected goes to the United States Treasury.

Soil and Moisture

The Bureau of Land Management soil and moisture, range improvement, and weed-control programs are designed primarily to protect and rehabilitate the rangelands. BLM works to prevent further deterioration of surface resources by wind and water erosion, fire, insects, weeds, and man, and to control water run off and erosion increase forage production, eliminate worthless plants and trees, and generally maintain these lands in the best possible condition.

Areas of the national land reserve in Colorado receive as little as 9 inches of rainfall annually. To take advantage of all water possible, water-spreading systems are devised where soil and topography will permit, to reduce the rapid runoff of water and sediment and to permit more water to soak into the soil.

In areas where brush is pulled with chains, sprayed, or plowed under, reseeding is usually done, often by plane. Brush control has been accomplished on almost 33,000 acres in the State, and more than 81,000 acres have been seeded.

Seeding programs for forests on the national land reserve are also being carried out. A total of 175,000 ponderosa pine seedlings were planted by hand on a burned area of 445 acres in 1961. Arrangements have been made with the State Board of Agriculture for 500,000 tree seedlings annually to be used to reforest timber sale areas. Most of the timber sold from the national land reserve in Colorado is purchased by small operators.

The largest amount of revenue returned to the State comes from oil and gas leasing on the national land reserve. Mineral leasing receipts, amounting to 37½ percent, are returned to the States in which the minerals are found. This amounted to more than $3 million returned to the State of Colorado in 1961. The remaining portion, 52½ percent of mineral leasing receipts, go into The Reclamation Fund.

In addition to oil and gas, Colorado is rich in potential mineral deposits, including such precious metals as gold and silver.

The orderly transfer of ownership of land under such laws as the Small Tract Act and Recreation and Public Purposes Act is one of BLM's important responsibilities. Before any land can be transferred it must be classified to make sure it is most suitable for the purpose for which an application is made.

Homesteading is practically a thing of the past in Colorado. In 1961 only 640 acres were classified as suitable for transfer under the agricultural land laws. During 1961, on the other hand, more than 20,000 acres were classified as suitable for homesites and summer cabin sites, and were sold as small tracts.

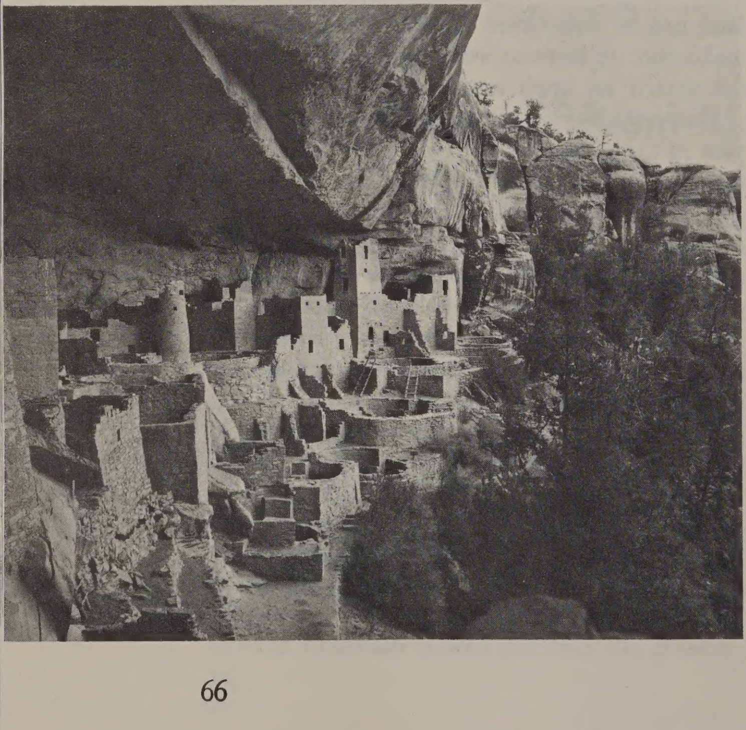
BLM inventories show that 6.6 million acres of the national land reserve in Colorado are suitable for various recreational purposes.

Estimates show that more than 300,000 people visited the national land reserve in Colorado annually to fish and hunt, ski, hike, picnic, or just to look. Under a new pricing schedule, BLM makes land for recreation purposes available to State and local governments for $2.50 an acre.

Programs of the National Park Service

Notch Top Mountain, seen from the Odessa Lake Trail, is a prominent feature of Rocky Mountain National Park.

Mesa Verde National Park is noted for the cliff dwellings of ancient Indians who lived in these "apartment" houses for many centuries before the coming of European explorers and settlers.



The National Park Service administers nine areas in Colorado: Mesa Verde and Rocky Mountain National Parks; Black Canyon of the Gunnison National Monument; Colorado National Monument; Dinosaur; Great Sand Dunes and Hovensweep National Monuments; Shadow Mountain National Recreation area; and Bent's Old Fort National Historic Site project, described earlier in this book.

Under a continuing long-range program of development of areas in the National Park System, the Service is moving ahead in its improvement plans for Colorado areas. For example, from the handsome terrace of the new, many-windowed Visitor Center at Great Sand Dunes National Monument, tourists can gaze north at the tremendous snow caps and forest slopes of the Sangre de Cristo Mountains. From the Visitor Center, a road winds through the cottonwoods and willow of Mosca Creek to the Montville Nature Trail.

A large, well-equipped site for campers has been laid out in the grasses beyond the nature trail, and the road ends at a big parking and picnic area at the edge of the dunes.

Other Park Service conservation and development programs in Colorado include: Picnic development at Dinosaur; Alpine Visitor Center at Rocky Mountain National Park; ruins repair and stabilization at Hovensweep; and stabilization of Cliff Palace and Free-Standing Arch above Little Long House, Mesa Verde National Park. A major roads program at Mesa Verde is the realinement of the Navajo Hill portion of the entrance road and the parking area.

Minor Roads and Trails programs in Colorado cover the construction of walks and driveways as well as access and circulatory roads and a new campground at Great Sand Dunes while at Mesa Verde work includes, in the general park, improvements to existing trails, walks to ruins and overlooks and at Navajo Hill district of the park, the construction of campground roads, spurs, loops, and turnouts and the obliteration of old roads.

In Rocky Mountain National Park, work on nearly 4 miles of Trail Ridge Road is progressing. Trail Ridge Road which follows a trail used by the Utes and Arapahoes Indians, is a broad seasonal road through the Park and is perhaps the best known road in the Park. The work consists of the reconstruction and a small relocation of the road between the Fall River entrance and Deer Ridge, reconstruction of the Deer Ridge intersection, construction of two large parking areas at Sheep Lake overlooking Horseshoe Park and five additional parallel pullout parking areas.

The contract for work on Trail Ridge Road will improve traveling conditions and provide parking areas for the visitors to stop and enjoy the scenic views.

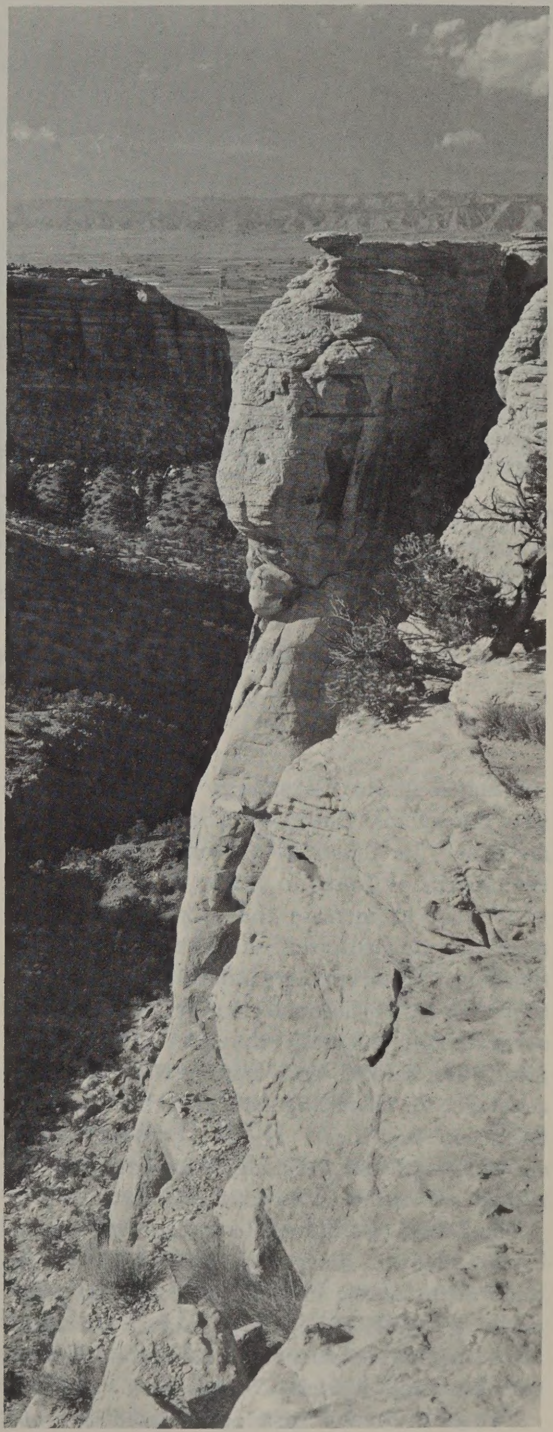
In Mesa Verde National Park, the Park Service is surveying the Morfield Canyon area near the Park entrance for a new campground. This area is one of the few suitable areas for camping in the Park. The Service is going ahead with the construction of the visitor center, overnight accommodations, restaurant and other concessions in the Navajo Hill area.

Many new ruins are also being excavated at Mesa Verde which will provide additional knowledge of the prehistoric inhabitants of the area.

By 1966, Park visitors to the State of Colorado will find many projects completed for public use and enjoyment as well as interpretation of the parks and monuments. These facilities include: ranger stations, comfort stations, picnic tables, fireplaces, interpretive signs and markers, trailside shelters, skiing facilities, as well as major and minor road construction. There also will be information centers, campground development and campfire circles.

However, the real accomplishment of the Park Service's long-range programs are measured, not by miles of new roads, campgrounds, or visitor centers, but by how well the program as a whole accomplishes the purpose of National Parks—to preserve the Nation's heritage in wild lands, scenery, and historic treasures for the enjoyment and inspiration of Americans.

Colorado National Monument is one of Colorado's many scenic resources preserved by the National Park Service.



The functions of the Bureau of Outdoor Recreation are of considerable significance to Colorado, as they serve to increase the supply of outdoor recreation opportunities within the State. Here a family enjoys an outdoor meal at the Stillwater Campground, near Lake Granby.

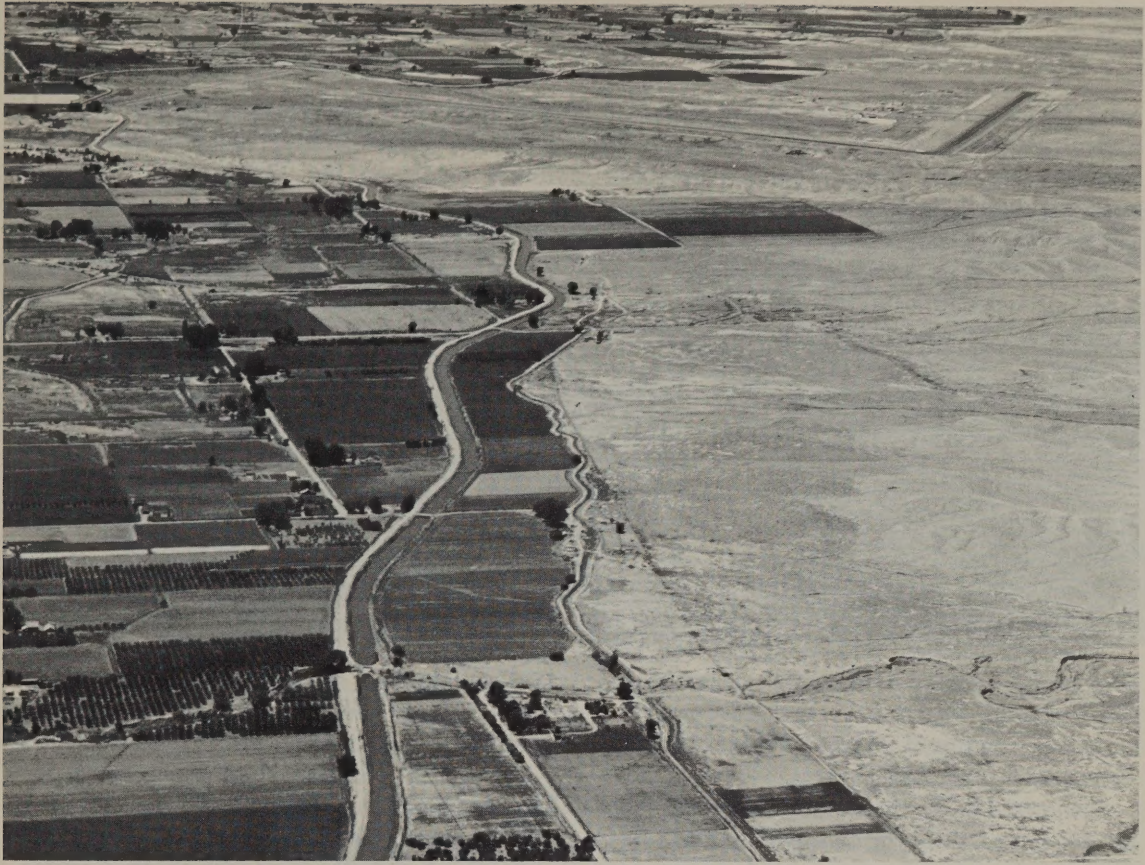
Bureau of Outdoor Recreation

Situated in the Department of the Interior, the Bureau of Outdoor Recreation manages no land. Its functions are of significance to the citizens of Colorado and to tourists because they serve to 'increase the supply of outdoor recreation opportunities within the State. The functions are of even more immediate importance to the State of Colorado, its departments and subdivisions, since the Bureau provides technical, professional and may provide financial assistance in installing needed public outdoor recreation facilities. It also stimulates and encourages private and nongovernmental organizations concerned with outdoor recreation.

The Bureau of Outdoor Recreation was created by Presidential order and established in the Department of the Interior by Secretarial order in the spring of 1962. These actions were taken at the recommendation of the Outdoor Recreation Resources Review Commission.

The new Bureau correlates related outdoor recreation programs of some 20-odd Federal bureaus in several Departments and in independent agencies. It is responsible for establishing a National outdoor recreation policy and a nationwide recreation plan based on State, regional and Federal plans. It is also responsible for stimulating outdoor recreation by providing cooperative planning and survey assistance to the States.

The Bureau is responsible for establishing guidelines for the management of outdoor recreation resources, for expanding, modifying and intensifying present programs to meet increasing needs for outdoor recreation, for administering State grants-in-aid for planning and acquisition of recreation facilities which the Congress may authorize, for sponsoring and conducting outdoor recreation research and for encouraging interstate and regional cooperation in outdoor recreation projects.



This aerial view of Colorado's Grand Valley dramatically points up the value of Reclamation projects to the State by contrasting the lush irrigated lands to the left of the canal with the desert wastes on its right.

Bureau of Reclamation Programs

The Bureau of Reclamation has been a vital force in the development of Colorado's water resources since 1903. Today, seven major reclamation projects have been completed and construction is continuing on another seven. Over a dozen other projects currently are being investigated by the Bureau.

As irrigation works increase, hydroelectric power has been generated, navigation improved, municipal and industrial water supplies developed, and flood control instituted. The multipurpose principles of modern day Reclamation dams in Colorado also include fish and wildlife enhancement and outdoor recreational development.

The *Uncompahgre Reclamation project* in western Colorado was one of the initial five projects authorized in 1903. Its principal feature is a 6-mile long tunnel through which water is diverted from the Gunnison River to the Uncompahgre River Valley for irrigation. The Taylor Park Reservoir, later constructed on a tributary of the Gunnison River, stores water for late-season use. The project serves over 76,000 acres of land.

The *Colorado-Big Thompson project*, completed in 1959, is one of the larger irrigation projects constructed by the Bureau of Reclamation. It consists of a 13-mile water tunnel, five powerplants and reservoirs, and natural water courses with irrigation canals which spread water on agricultural lands as a supplemental supply to 720,000 acres. The Green Mountain Reservoir and hydroelectric powerplant of 21,600 kilowatt capacity is an important part of the project.

The *Grand Valley project*, in the Colorado River Basin in west-central Colorado, furnishes water to about 42,000 acres of land in the vicinity of Grand Junction. The project works include a diversion dam, a power plant, two pumping plants, canal lateral, and drainage systems.

Other major Reclamation dams include the *Fruitgrowers Dam project*, Platoro Dam and Reservoir (completed unit of the four divisions of the San Luis Valley project), and *Bonny Dam and Reservoir* (part of the Saint Francis Unit, Missouri River Basin project).

Other Reclamation projects include the *Pine River project*, which provides supplemental irrigation water for 41,000 acres, and the completed or nearly completed *Mancos*, *Collbran*, *Florida*, *Paonia*, and *Smith Fork* projects.

Authorized under the Colorado River Storage Project Act of 1956, the *Curecanti Unit* will be a river regulatory and power development. Its three dams and powerplants will develop 1,000 feet of power head along a 40-mile reach of deep canyon section of the Gunnison River, near Gunnison. The combined storage capacity of the three dams will exceed one million acre-feet and, located in a region famed for its recreational attractions, are expected to provide significant recreational benefits.

The Colorado River Storage Project Act specified 25 potential projects in the Upper Colorado River Basin, 21 of which will be in western Colorado. Sale of power generated at the storage units will provide funds to pay for the units and also to contribute toward payment for the irrigation works of the participating projects.

Investigations have been completed on a number of these projects: reports on the *Savery-Pot Hook project* (Wyoming-Colorado) and the *Bostwick Park project* (Colorado) have been recommended to the Congress for authorization; the proposed report on the *Fruitland Mesa project* has been reviewed by the affected States and interested Federal agencies as required by law and inter-agency agreement; review by the States and agencies of the proposed *Animas-La Plata project* is expected shortly; and a proposed feasibility report on the *Dolores project* is being completed.

Investigations are continuing on additional projects in Colorado, including *Grand Mesa*, *Juniper*, *Parshall*, *San Miguel*, and *Dallas Creek*. Other investigations are scheduled for the future.

Recently authorized by Congress, the *Fryingpan-Arkansas project* will consist of a system of canals and tunnels west of the Continental Divide to collect water from Hunter Creek and Fryingpan River and a reservoir at *Ruedi* to provide 100,000 acre-feet of storage for replacement and other Western Slope uses. It will also include a 5.3 mile tunnel to carry diverted water to the Eastern Slope, enlargement of *Twin Lakes* and *Sugar Loaf Reservoirs* to allow about 377,000 acre-feet of additional storage, the 400,000 acre-foot *Pueblo* multipurpose reservoir, and seven powerplants with a total capacity of 123,900 kilowatts.

The Bureau of Reclamation project in the Rio Grande Basin in Colorado is the *San Luis Valley project* which encompasses almost the entire San Luis Valley, and includes the Conejos, Rio Grande, Weminuche Pass, and Closed Basin divisions. *Platoro Dam and Reservoir*, the principal feature of the Conejos Division was completed in 1951. Weminuche Pass and Rio Grande divisions are under investigation. The proposed facilities of Wagon Wheel Gap Dam and Reservoir in the Rio Grande division would regulate flows of the Rio Grande for control of floods and to serve the irrigated lands. The Closed Basin division would provide for the salvage of water by selective pumping from wells in the Closed Basin, in the vicinity of Alamosa, Colorado, and for delivery of the salvaged water to the Rio Grande south of Alamosa by means of a conveyance channel.

Two important U.S. Army Corps of Engineers projects—though constructed primarily for flood control purposes—also contribute significantly to the State's irrigation and outdoor recreational resources. These are the John Martin Reservoir project, whose dam spans the Arkansas River about 58 miles upstream from the Colorado-Kansas State line; and the Cherry Creek Dam and Reservoir in the Denver environs.

Grand Lake, an important recreational resource, is a natural lake located in Rocky Mountain National Park.

Summary

Colorado—the Centennial State—is, as you have seen from this booklet, an area rich in natural mineral resources, timber, fish and wildlife, as well as tremendously endowed with scenic beauty and recreational lands.

Conservation and wise use and development of the resources of land and water mean sound and continuing progress.

The Department of the Interior—in cooperation with State and other Federal agencies—has played an important role in furthering Colorado's growth and progress, and its efforts will be increased and strengthened in the years to come.

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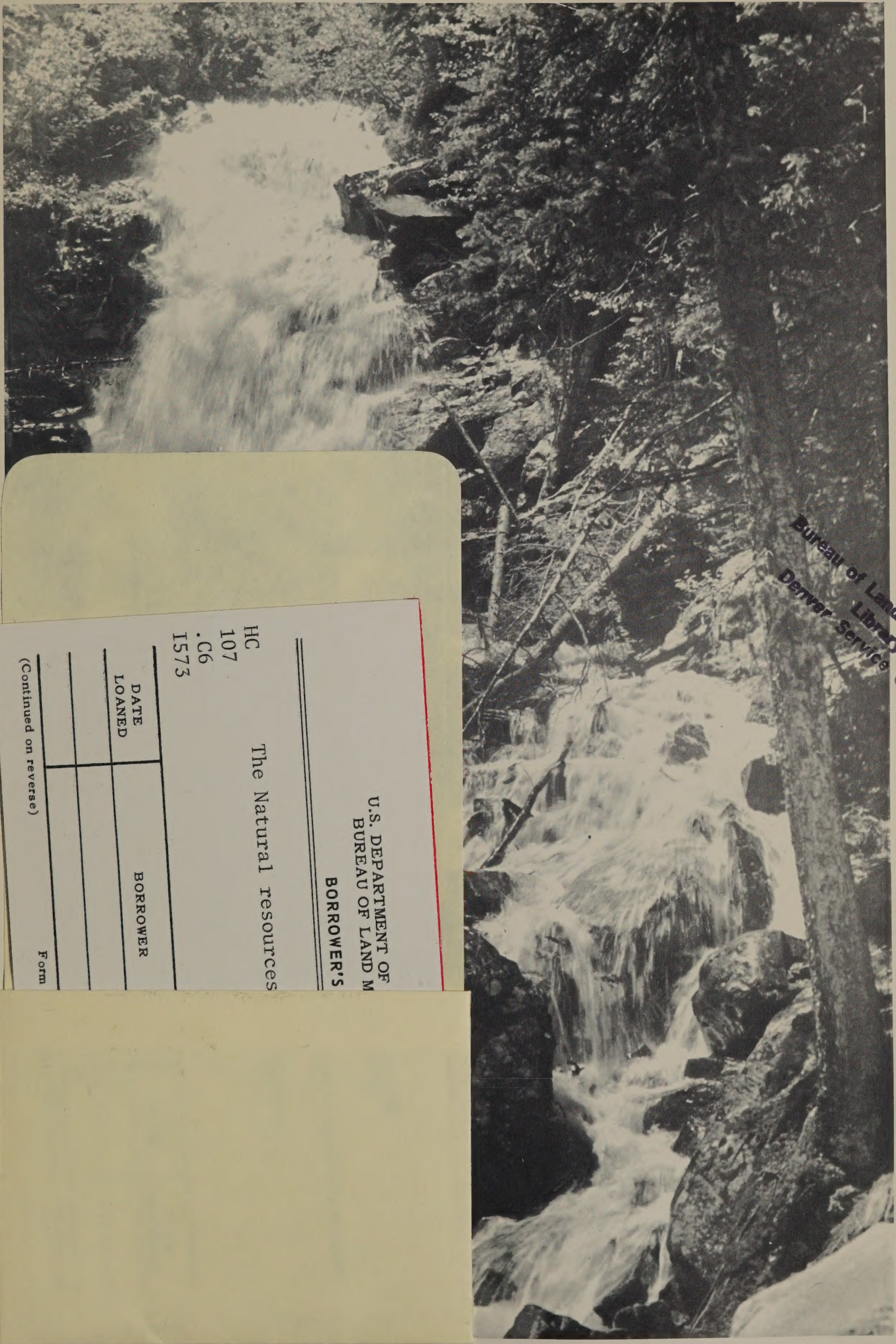
(Right) A frothing Colorado mountain stream becomes all things to all people—a cold drink, a trout run, a striking view, a soothing sound.

(Above) Sheep Lake and the shadowed Mummy Range of Rocky Mountain National Park typify the rugged wilderness scenery that makes Colorado a year-round attraction.

U.S. GOVERNMENT PRINTING OFFICE: 1963 O—674-433

For sale by the Superintendent of Documents, U.S. Government Printing Office
Washington, D.C., 20402 - Price 50 cents



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Created in 1849, the Department of the Interior—a Department of Conservation—is concerned with the management, conservation, and development of the Nation's water, fish, wildlife, mineral, forest, and park and recreational resources. It also has major responsibilities for Indian and Territorial affairs.

As the Nation's principal conservation agency, the Department works to assure that nonrenewable resources are developed and used wisely, that park and recreational resources are conserved for the future, and that renewable resources make their full contribution to the progress, prosperity, and security of the United States—now and in the future.

March 3, 1849